EXHIBIT OO-1

Transcript of Google 2014 I/O Conference Keynote

June 25, 2014

2:50 FEMALE SPEAKER: Ladies and gentlemen,

2:52 please welcome Senior Vice President, Android, Chrome,

2:55 and Apps, Sundar Pichai.

3:08 SUNDAR PICHAI: Thank you everyone.

3:10 It's great to see all of you.

3:12 Welcome to Google I/O. Every year,

3:15 we look forward to this date.

3:16 We've been hard at work since last I/O evolving our platforms

3:21 so that developers like you can build amazing experiences.

3:24 So thank you for joining us in person.

3:27 I/O is a pretty global event.

3:30 We have viewing parties in over 597 locations

3:35 in 85 countries in six continents,

3:39 and there are over one million people

3:42 watching this on the live stream today.

3:45 Let's say hello to a few locations.

3:46 London.

3:48 [APPLAUSE]

3:53 Hello, London.

3:57 Let's say hello to Brazil.

3:58 Everyone is talking about Brazil today.

4:01 If it weren't for I/O, I would be there for the World Cup.

4:05 [APPLAUSE]

4:15 I'm tempted to shout, "Goal."

4:18 Finally, let's go to Nigeria.

4:20 We're thrilled to have an all-female developer group

4:22 in Nigeria, and--

4:24 [APPLAUSE]

4:35 We're working hard to elevate women in computer science,

4:38 so look forward to seeing what they develop one day.

4:41 In fact, at I/O this year, we are very excited.

4:45 There is over 20% female participation,

4:48 which is up from 8% last year.

4:51 [APPLAUSE]

4:56 And even more excited, we are joined

4:59 over 1,000 women in this room today, so thank you.

5:08 Of course, I/O is when we talk about our two large computing

5:12 platforms, open platforms, Android and Chrome, which

5:17 are built from the ground up for developers like you.

5:21 Today, we're going to give you an update

5:23 on the momentum we are seeing in mobile.

5:25 We are living in amazing times, so we

5:27 want to talk about the mobile momentum we see

5:31 and how we are evolving our platforms to support

5:35 that momentum.

5:36 And more importantly, we are beginning to think and evolve

5:38 our platforms beyond mobile.

5:40 You will hear about that from us today.

5:42 And finally, we want to talk to you

5:44 as developers as to how you can achieve success

5:47 on top of our platforms, including an update on Google

5:51 Cloud Platform and Google Play.

5:53 So let's get started.

5:57 If you look at global smartphone shipments,

5:59 the numbers are stunning.

6:01 The industry shipped over 300 million phones last quarter,

6:04 so they are on track to ship well

6:06 over a billion phones each year.

6:09 So how is Android doing in the face of this momentum?

6:13 In the past, we've talked about cumulative activations

6:16 of Android.

6:17 We're switching and focusing on 30-day active users,

6:20 users who are currently using their Android devices globally.

6:24 And you can see the number has been doubling every year.

6:27 We've gone from 220 million to over 530 million

6:30 as of last year's I/O. We are very excited.

6:33 As of this year's I/O, we are over one billion

6:36 30-day active users.

6:38 [APPLAUSE]

6:43 The robot is pretty happy as well.

6:46 So let's internalize what one billion users actually mean.

6:49 Android users, on a given day, send

6:52 over 20 billion text messages each and every day.

6:56 More importantly, perhaps, they take around 93 million selfies

7:01 every day.

7:02 The team tells me about 31 million

7:04 of these are duck faces.

7:07 We estimate Android users take around

7:11 1.5 trillion steps per day, and they pull out their phones

7:16 and check it over 100 billion times each day.

7:19 Important use cases which we are working on addressing,

7:23 and you'll hear about it later today.

7:27 Developers are building profound experiences

7:29 on top of smartphones.

7:31 Stories we hear every day.

7:33 Few examples.

7:35 In Kenya, 40% of Kenya's GDP flows through M-Pesa,

7:39 giving unbanked people access to financial transactions

7:44 throughout the country.

7:47 Netra G. A company uses a smartphone and just

7:50 off the shelf accessories to measure your eye prescription,

7:54 and they are as accurate as $50,000 equipment

7:58 you find in optometrists' offices,

8:00 providing very, very affordable care too many people.

8:04 And finally, University of Michigan,

8:06 they are using for their patients,

8:08 they monitor subtle changes in voice quality

8:11 using their smartphone to detect early signs of bipolar

8:15 disorder.

8:16 So the kind of experiences we are

8:18 seeing on top of these phones are amazing.

8:22 So far, I've been talking about phones.

8:24 Let's shift to tablets.

8:26 We are seeing amazing growth in Android tablets as well.

8:30 There is tremendous adoption of these devices,

8:33 and if you look at how we are doing vis a vis the overall

8:36 market, Android tablets accounted

8:39 for 39% of all shipments two years ago.

8:42 That number increased to 46% as of last year's

8:45 I/O. As of this year's I/O, Android tablets

8:50 account for 62% of the overall market.

8:52 [APPLAUSE]

8:55 We don't include other variants of Android like Kindle.

8:59 If you add that, it would go up a few percentage points.

9:02 These are shipment numbers.

9:03 Again, we care about usage, so we

9:06 view these as leading indicators of where usage would be.

9:09 If you take a look at tablet usage,

9:12 we're going to use YouTube as a proxy to understand usage.

9:17 A year ago, the total tablet viewership of YouTube, 28%

9:22 was from Android.

9:23 That number has gone up again to 42%.

9:26 So we are seeing usage track shipments,

9:28 and we are very excited people are

9:30 adopting these devices as well.

9:32 Another metric of engagement is app installs.

9:36 App installs just this year alone on tablet

9:39 is up by over 200%, so people are really

9:43 engaging with these devices.

9:46 So we are very excited we have a billion uses,

9:48 but we talked about this at last year's

9:50 I/O. Our goal is to reach the next five

9:53 billion people in the world.

9:55 If you look at a map of the world today, all the regions

9:59 in blue, emerging markets, the majority of users,

10:03 don't have a smartphone.

10:06 When I go back home to India and other countries like that--

10:11 [APPLAUSE]

10:14 Thank you.

10:14 It is exciting to see the impact phones have on people's lives,

10:19 but it's disappointing that less than 10% of the population

10:22 have access to smartphones.

10:24 We want to change that.

10:26 So we've been working hard with our ecosystem

10:30 on a very important initiative which we call Android One.

10:35 So let me talk to you about Android One.

10:38 What we are doing for the first time,

10:39 if you look at all the OEMs in these countries, each of them

10:43 has to reinvent the wheel, and in a fast-paced mobile

10:46 industry, they have to build a new smartphone

10:49 within nine months.

10:50 So we want to pool resources and help everyone,

10:54 so we are working on a set of hardware reference platforms.

10:58 We identify the components which go into a next generation

11:01 smartphone.

11:03 These are high quality, affordable smartphones.

11:06 We qualify vendors so that we provide

11:09 a turnkey solution for OEMs to more easily build a smartphone.

11:14 In addition to hardware, we are working on software as well.

11:19 So the software on Android One is the same software

11:22 you see running on stock Android, Nexus

11:24 phones, and Google Play edition phones.

11:26 In addition, through Play, we allow OEMs and carriers

11:31 to add locally relevant applications

11:34 on the device which users have full control over.

11:37 And finally, we provide full automatic updates.

11:41 All the software in Android One comes from Google,

11:44 so we will keep them updated just like we

11:46 do with Nexus and Google Play edition phones.

11:49 [APPLAUSE]

11:55 Let's take a look at one example device which we are working on.

11:58 So this is a device with Micro Max.

12:00 You can see there's a 4.5 inch screen.

12:03 It has features which matter to a country like India-- dual

12:06 SIM, removable SD cards, and FM radio.

12:11 I'm used to cutting edge phones, and I've

12:13 been using this phone for awhile, and it is really good,

12:16 and it costs less than $100.

12:19 [APPLAUSE]

12:25 We are working with many partners.

12:27 We are going to be launching this around the world,

12:29 but we started this journey in India,

12:31 and we are launching this with three OEMs in India

12:33 in the fall of this year, Micro Max, Carbon, and Spice.

12:38 We are also working with carriers in these markets

12:43 to provide affordable connectivity packages

12:45 with these devices.

12:47 What we are excited is this is a leverage turnkey solution

12:51 so that at scale, we can bring high quality,

12:55 affordable smartphones so that we can get the next billion

12:58 people access to these devices, and we

13:01 can't wait to see the impact that it will have.

13:07 So we've talked about the momentum in mobile.

13:10 The next thing we want to talk to you

13:11 is about how we are evolving our platforms, Android and Chrome.

13:17 And today, for the first time since we

13:20 launched Android with the open SDK,

13:22 we're going to give you a preview of the upcoming L

13:25 release.

13:26 [APPLAUSE]

13:32 You will be able to download this later on your development

13:35 devices.

13:36 We've been working very hard.

13:38 This is one of the most comprehensive releases

13:40 we have done.

13:41 It has over 5,000 new APIs, and we are thinking about L release

13:46 not just for mobile, but for form factors beyond mobile.

13:51 One of the things, as we thought about L,

13:54 we wanted to take a radical, new approach to design.

13:57 User experiences are evolving rapidly,

14:00 and we wanted to rethink the user design

14:02 experience in Android to have a fresh, bold, and new look.

14:07 To talk about the design for L, let me invite Matias Duarte.

14:12 [APPLAUSE]

14:17 MATIAS DUARTE: Thank you, Sundar.

14:21 Design is essential in today's world.

14:23 It defines your experiences and your emotions.

14:27 So we challenged ourselves to create a design that was not

14:30 just for Android phones and tablets.

14:33 We worked together-- Android, Chrome, and across all

14:38 of Google-- to craft one consistent vision

14:41 for mobile, desktop, and beyond.

14:46 We wanted a design that was clear and simple,

14:49 and that people would intuitively understand.

14:52 So we imagined, what if pixels didn't just

14:56 have color, but also depth?

14:59 What if there was an intelligent material that

15:02 was as simple as paper but could transform and change

15:05 shape in response to touch?

15:11 And this led us to a way of thinking

15:14 that we call material design.

16:07 [APPLAUSE]

16:12 We drew inspiration from paper and ink.

16:15 However, unlike real paper, our digital material

16:19 can expand, reform, and reshape intelligently.

16:23 The material has physical surfaces and edges

16:26 because the human mind is wired at its most primitive level

16:30 to instinctively understand objects

16:32 and their relationships.

16:34 Those scenes and shadows provide meaning

16:36 about what you can touch and how it will move.

16:40 In the real world, every small change in position and depth

16:44 creates subtle but important changes

16:47 in lighting and shadows.

16:49 So as part of the L preview, we'll now allow app developers

16:52 to specify an elevation value for any UI surface,

16:57 and the framework will render it in correct perspective

17:01 with virtual light sources and real time shadows.

17:04 [APPLAUSE]

17:09 Material design is beautiful and bold

17:12 because clean, typographical layouts

17:14 are simple and easy to understand.

17:17 Your content is the focus.

17:19 So the L preview will allow app developers

17:21 to easily colorize all framework elements in your app

17:25 to match the theme to your brand.

17:27 And we're previewing a new support library

17:30 that we call Palette to easily extract colors from images

17:33 and really put those vivid pictures front and center.

17:37 We're giving designers familiar tools like baseline grids

17:42 that work across screens.

17:44 Grids ensure apps have a consistent rhythm

17:46 and character, and this will allow

17:48 you to start with a design on a phone,

17:50 and logically and easily bring that same design to tablets

17:54 and laptops.

17:56 Now, one design doesn't mean one size fits all.

17:59 Our guidelines allow you to appropriately adapt the UI,

18:02 so your users will already know their way around your app

18:07 no matter what screen they use it

18:08 on And we've also updated our system font, Roboto,

18:15 so that designers and developers can use one type face designed

18:19 and optimized for every screen, from your watch to your laptop

18:23 to your television.

18:26 So now let's talk about animation.

18:28 It's delightful when your touch is rewarded with motion,

18:31 and material surfaces slide around

18:33 with the physics of card stock, but they

18:36 respond to touch with splashes of virtual ink

18:39 that are like ripples in a pond.

18:41 As part of the L preview, all of your application's UI building

18:45 blocks have been updated to include rich, animated touch

18:49 feedback.

18:50 [APPLAUSE]

18:52 And no detail is too small to bring a smile to your face,

18:57 like when the reload button loops around or the playback

18:59 controls can change.

19:02 Finally, in the real world, nothing teleports from one

19:05 place to another, and that's why it's so important

19:07 to animate every change on screen

19:10 in a way that makes sense.

19:12 In the L preview, Android developers

19:14 will now be able to create seamless animations

19:17 from any screen to any other between activities, and even

19:21 between apps.

19:23 [APPLAUSE]

19:27 So you're probably wondering how this looks like in practice.

19:30 We're going to give you a sneak peak at one

19:32 of our familiar Google applications

19:34 in the new material design.

19:38 Here you can see, step by step, how

19:40 we update the design-- the typography,

19:46 the grid changes, and finally, the surfaces and bold colors.

19:55 And a few small changes make a really big difference.

19:59 And you can also see how easy it is

20:01 to take that same design to different screens.

20:06 Now, I've talked about only a few

20:09 of the highlights of material design and just some

20:11 of the APIs that you can try out in the Android L preview.

20:16 But as we all know, people spend an enormous amount of time

20:19 on the web, and especially the mobile web.

20:22 Last year at I/O, we announced Polymer,

20:25 which was a powerful new UI library for the web.

20:29 Today, we're bringing you all of the material design

20:32 capabilities to the web through Polymer.

20:36 As a web developer, you'll be able to build applications

20:41 out of material design building blocks

20:43 with all of the same surfaces, bold graphics,

20:46 and smooth animations at 60 frames per second.

20:54 So between the L preview and Polymer,

20:57 you can bring the same rich, fluid material design

21:02 to every screen.

21:04 And to help you take full advantage of this framework,

21:07 we've also completely redesigned and created

21:10 one unified set of style guidelines for every screen

21:14 and for all devices.

21:16 These guidelines will help designers and developers

21:18 alike understand best practices and build

21:20 consistent, beautiful experiences.

21:24 We're releasing the first draft of these guidelines as part

21:27 of our preview today at google.com/design.

21:30 [APPLAUSE]

21:35 And now that you've seen our new look and feel,

21:37 I'd like to invite Dave Burke to show

21:39 you some of the new features in the Android L developer

21:42 preview.

21:43 [APPLAUSE]

21:48 DAVE BURKE: All right.

21:49 So over the last eight months, our team

21:51 has been busy cooking up the biggest

21:53 release in the history of Android.

21:55 And as Sundar mentioned, we've added

21:57 over 5,000 new APIs touching nearly every aspect

22:01 of the system.

22:02 Now, we don't have time to even come

22:04 close to covering everything in L today,

22:05 so instead, what I'd like to do is walk you through some

22:08 of the highlights of the tremendous steps

22:11 we're taking on the user experience

22:13 and on the performance of the underlying platform.

22:16 So let's start with user experience.

22:19 Now, bringing material to L is, of course,

22:22 a big part of what we're trying to do here.

22:24 We've added a new material theme,

22:25 so it's a new style for your application

22:27 that includes new system widgets, transition animations,

22:30 and animated touch feedback.

22:33 We've also added new animation support,

22:35 so a new drawable for animated ripples, a reveal animator

22:38 to animate a clipping circle to reveal views.

22:41 And we've extended views to not just have an x and y component,

22:45 but also a z component to provide elevation.

22:48 So you can float elements of your UI

22:50 and the framework will cast a real time shadow for you.

22:53 My favorite feature that we've added in support of material

22:56 is the ability to customize activity, entry,

22:58 and exit animations.

23:00 You can even include a share a hero element,

23:02 for example, an image that starts in one activity

23:05 and animates seamlessly through translation and scaling

23:08 into another.

23:09 So let's take a look at this in practice.

23:11 Let's have a look at an app we're all familiar with,

23:13 which is the phone dialer.

23:15 Thanks, Marcello.

23:18 So the first thing you'll notice when you fire up the phone

23:21 dialer are those bold material colors and shadows.

23:25 And you'll see the ripple touch effect

23:28 as I touch each of these tabs, and you'll

23:30 get a more subtle material touch effect on the recent calls.

23:34 You'll see that the Dialer button has its elevation set

23:36 so it's floating above the UI, and as I tap it,

23:39 you get these really nice, delightful animations.

23:43 Now, another feature we added to support material

23:45 is something we call nested scrolling.

23:47 And the idea is as I scroll, we propagate the scroll events

23:50 up the view hierarchy and different parts of your views

23:54 can respond differently.

23:55 So for example, as I scroll upwards here,

23:57 you'll notice that the recent call to Marcello

23:59 will start to shrink and disappear,

24:01 then the search box will start getting pushed upwards

24:04 and the tabs will lock into place.

24:06 It's a really nice effect.

24:08 So let's go over to the dialer.

24:12 So it turns out my mom's a big fan of material design.

24:14 I need to go call her up and tell her

24:16 about how to set elevations on her views.

24:17 I know she loves that.

24:18 So let's go ahead and start dialing.

24:20 You'll see that ripple touch effect again

24:21 emanating out from the buttons.

24:24 Then when I go to place a call, you'll see a view animator,

24:27 and it will animate into the in call screen like so.

24:31 It's a really nice effect.

24:34 So that's a quick taster of material in L.

24:37 What you're seeing here is really

24:38 a sneak peak of work in progress.

24:41 We wanted to give you guys early access

24:43 so you could start bringing material to your apps.

24:46 And we also recognize that changing

24:48 the UI in such a big way will take some time,

24:50 so we started with the dialer as a showcase.

24:53 Over the coming summer months, we'll be extending material

24:56 to all aspects of our apps on the system,

24:58 and the result is going to be a dramatically enhanced, fresh

25:01 user experience.

25:05 So another area where we've improved the user experience

25:08 on L is around notifications.

25:10 One of the most frequent reasons we all

25:12 take our phone out of our pocket every day

25:14 is to respond to incoming notifications.

25:17 We all do this dozens and dozens of times a day,

25:20 so we wanted to streamline the process, everything

25:23 from the phone buzzing to you acting on the notification.

25:26 In L, we give you instant, interactive access

25:29 to notifications right from the lock screen.

25:32 So now you can read, open, and dismiss in seconds.

25:36 So let's take a look at my device.

25:38 The first thing you'll see are all my top notifications

25:41 on the lock screen, and we're rendering them

25:43 as sheets of material.

25:44 They animate really beautifully.

25:45 If I touch them, you can see that material touch effect.

25:48 Now, in L, we've improved the way Android organizes

25:51 and prioritizes notifications by analyzing user behavior

25:55 to make sure only the most useful, relevant notifications

25:58 are presented to you.

26:00 I can swipe down and I get my full list of notifications.

26:04 And we've done a clever thing here

26:05 where we've merged the notification shade, something

26:08 that's been in Android since 1.0, with the lock screen.

26:11 And so from here, I can double tap on a notification

26:14 to launch the corresponding app, or if there's

26:16 something I don't need, I can just

26:18 dismiss with a single swipe.

26:20 And to unlock the phone, well, this

26:22 is just a notification shade, so you just swipe it away

26:25 and you're straight into the device, fast and simple.

26:28 We've also introduced a new type of notification

26:31 in L that we call the heads up notification,

26:34 and this can be used to let you know about something urgent

26:36 without interrupting what you're doing.

26:38 So let's say I'm playing my new favorite game, which

26:40 is Piano Tiles, and I'm going along

26:42 here, about to get my highest score ever.

26:44 And then all of a sudden, I get a call from Marcello.

26:47 So from here, I can keep going or, if I

26:49 want to act on it, I can answer it, or if I'm busy,

26:51 swipe it away.

26:53 And then I can go back to my game

26:55 and get the highest score that I've ever got in public.

26:59 Yeah!

27:01 That's actually my worst score I've ever got.

27:03 Anyway, let's move on.

27:05 So while we've made the notifications more powerful,

27:08 if you're one of the approximately 15%

27:10 of people who has a PIN or pattern lock,

27:13 you waste many minutes a day cumulatively

27:15 on that fiddly task of entering your PIN

27:17 So we figured there's got to be a better way.

27:19 In L, we're introducing a new concept

27:22 we call personal unlocking.

27:24 And personal unlocking enables the device

27:26 to determine if it's in a trusted environment, say

27:28 in the owner's hand or beside the owner on a table.

27:32 Personal unlocking uses signals such as locations

27:34 you designate, Bluetooth devices that are visible,

27:37 even your unique voice print.

27:39 So for example, let's have a look at this device.

27:41 Thanks, Marcello.

27:43 So I currently have a pattern lock on this device,

27:47 but because I'm wearing a Bluetooth watch,

27:49 my phone knows it's me who's present,

27:51 and so it doesn't challenge me with an unlock.

27:54 So for example, if I just swipe up,

27:56 the phone will unlock just like that.

27:58 Now, let me reset that.

28:00 If I take my watch off-- let me just

28:01 hand it to Marcello-- so now, my phone

28:06 can no longer see the watch.

28:08 And because of that, my phone cannot ascertain if it's me

28:10 who's present.

28:12 As a result, my phone will lock down its security.

28:14 So now, when I go to unlock the device,

28:17 it presents me with a PIN lock.

28:18 It's a really great feature.

28:20 [APPLAUSE]

28:26 So that's a few of the user experience improvements

28:28 we've made to support material and notifications.

28:32 Another area of L where we're significantly

28:34 improving the user experience is around

28:36 how we've integrated the mobile web into the platform.

28:39 So to learn more, let me invite up Avni Shah to the stage.

28:43 [APPLAUSE]

28:49 AVNI SHAH: Thanks, Dave.

28:51 A core part of your experience with mobile devices

28:53 is the mobile web.

28:54 Just to get a sense of the growth

28:56 that we've been seeing, at the beginning of last year,

28:58 we had 27 million monthly active users of Chrome on mobile.

29:02 Today, we have more than 300 million.

29:05 That's 10x growth.

29:06 [APPLAUSE]

29:07 Yeah.

29:08 It's awesome.

29:08 It's 10x growth in just the last year alone.

29:12 What that means for us is that we need to make the mobile web

29:14 work well for our developers and our users.

29:17 Today, I'm going to talk about three ways

29:19 we're going to do that.

29:21 We're enabling material design experiences on the mobile web,

29:24 we're redesigning recents to help you multitask,

29:27 and we're extending our capabilities of app indexing

29:30 to help people get to where they want to go faster.

29:33 So first, let's talk about material design.

29:35 One of the big parts of your experience with the mobile web

29:37 is, well, obviously, the websites themselves.

29:40 They need to work well.

29:41 They need to look great.

29:43 They need to be fun to use.

29:44 You heard Matias earlier talking about the philosophy

29:47 of material design, a bold, consistent, intuitive

29:51 experience that just works across screens.

29:53 Well, we've been working really hard at making

29:55 those experiences not just possible,

29:57 but the new standard for the mobile web.

30:00 To show you what this looks like,

30:01 my good friend Tom here is going to walk us

30:04 through an exploration of google.com search results

30:07 on the mobile web, re-envisioned with material design.

30:11 So, Tom, let's go ahead and do that search

30:13 for "A Starry Night."

30:15 Now the first thing that you see here

30:17 is that this panel is rendered as a beautiful material-style

30:20 card.

30:21 You notice the use of color.

30:22 The title is on s blue background that was actually

30:25 pragmatically matched to the painting.

30:27 And if Tom clicks on to expand the card,

30:30 you'll notice that it filled the screen

30:31 with a continuous animation.

30:33 If he scrolls, the header will shrink.

30:36 It won't pop into place, but it has a smooth animation

30:39 that just makes sense.

30:40 Now let's go ahead and click on the suggestion at bottom

30:42 to get more of van Gogh's artwork.

30:45 And you'll see those search results also smoothly animated

30:48 into place.

30:49 Tom is going to continue to give us

30:50 some demo eye candy over here.

30:53 And while this is just an exploration that you're seeing,

30:56 I want to mention that this is fast, fluid, continuous

30:59 animation at 60 frames per second.

31:03 This thing just wasn't possible year ago.

31:06 [APPLAUSE]

31:11 We've been working really hard at improving the performance

31:14 and predictability of the platform

31:15 to make things like this possible.

31:17 For example, this demo shows off the work

31:19 that we've done on touch latency,

31:20 giving you, as a developer, a notice of touch events earlier

31:23 in the frame so you have more time to act.

31:25 And as Matias mentioned earlier with Polymer,

31:27 our UI toolkit for the web, all of you

31:30 can build web experiences that feel as awesome as this.

31:35 The next big area we've been thinking about

31:36 is how to help you multitask.

31:38 And we think the Recents feature on Android

31:40 is one way we can actually make this easier, especially

31:42 as tasks cross both the web and apps, as they often do.

31:46 So once again, Tom is going to walk us through the changes

31:48 here.

31:51 So, Tom, let's go ahead and click

31:52 on the Recents icon, the lower right.

31:56 Now, as Tom scrolls through, the first thing that you'll notice

31:59 is Recents has also been grounded in material design.

32:01 You'll notice the overlapping cards

32:03 been rendered with realistic shadows and perspective.

32:06 But there's another thing going on here

32:08 that may not be immediately apparent.

32:11 Tom's Chrome tabs are also listed here as well.

32:14 He's been researching restaurants to go in SF,

32:16 so he has articles from the "New York Times" and the "SF

32:18 Chronicle" here as individual items.

32:21 You'll notice the site icons or the fav icons there.

32:24 As he scrolls back a bit further,

32:25 you'll notice he's been researching in the Urban Spoon

32:28 app.

32:28 He has Docs app open where he's been

32:30 collaborating with some friends.

32:32 So let's go ahead and click on that doc

32:33 and see what your friends have to say.

32:41 I've heard great things about state bird provisions.

32:43 Let's check out that article here.

32:48 Now what you see here as this loads is this

32:50 is actually loading as a website in Chrome.

32:52 You'll notice the URL up at the top.

32:54 Now, if Tom pops it back into Recents,

32:57 that page is now listed there, along with all

32:59 of his other open stuff.

33:01 I want to point out what the big difference is here.

33:04 This is a view you couldn't get before today.

33:07 If you wanted to get to all your open websites,

33:09 you'd have to go into Chrome and kind of flip through them

33:11 there.

33:11 But by bringing all of your individual Chrome tabs

33:13 here and listing them in your Recents view,

33:15 we're making it really easy for you

33:17 to move between the web and apps, making multitasking

33:20 just that much easier.

33:22 [APPLAUSE]

33:28 And last but not least, this change to Chrome

33:30 is actually built on top of a new API in L

33:33 that allows apps to populate multiple items in Recents.

33:35 So for all you app developers, does this kind of thing

33:37 make sense for you?

33:39 You can make use of it as well.

33:40 [APPLAUSE]

33:45 Going a step further, we're also making it easy

33:48 for you to find content using Google search,

33:50 whether it's deep in the web or deep in an app.

33:53 So last fall we announced app indexing.

33:55 As a developer, this capability lets you get your users

33:59 to app content directly from the search results page.

34:02 Since then, we've been working on a ton of UI improvements

34:05 and extending some APIs to make this more powerful.

34:08 But let me just give you a quick refresher

34:10 of what this capability enables.

34:13 So let's go ahead and do a search for Waterbar Restaurant.

34:15 I've heard good things about it over by the Embarcadero.

34:19 As Tom scrolls through the search results,

34:21 you'll see close the top there's a link for the home page

34:24 to Waterbar.

34:25 And near the bottom of the screen,

34:26 there's-- actually in the middle of the screen,

34:29 there's a result for Open Table.

34:32 Now what's different about this UI is this link to Open Table,

34:35 instead of going to the website, is actually

34:37 going to take us to the Open Table app

34:40 because Tom happens to have the app installed.

34:43 So let's go ahead and click on that link.

34:45 And you'll see it takes us directly

34:46 to Waterbar within the Open Table app.

34:48 [APPLAUSE]

34:54 Up until now, this was only available

34:56 to a few applications.

34:57 But today, we're opening it up to all Android app developers

35:00 globally, along with some tools to get you started.

35:03 [APPLAUSE]

35:07 And going further, if your app requires your users to sign

35:11 in, you'll be able to use Google+ sign-in in the coming

35:14 months to have your public content show up in search

35:17 as well.

35:19 You know, we thought this would be

35:20 even better if we could help your users rediscover content

35:23 that they've already found in your apps.

35:25 So we're adding a new API in Google Play services

35:27 to do just that.

35:29 So let's quickly show you how this works.

35:31 Tom found this really cool 3D tour of the Ferry Building

35:34 earlier, and he wants to get back to it.

35:36 So starting with the search box on his home screen,

35:38 he's going to do a search for Ferry Building.

35:41 And what you'll notice at the bottom of the screen

35:43 is there are search suggestions for Ferry Building

35:45 Marketplace in the Google Earth app.

35:47 And this is there because this is the app

35:49 that he was using when he found that tour before, even if he

35:51 himself didn't remember.

35:53 With a single click, he'll get taken directly

35:55 to the tour of the Ferry Building

35:57 within the Google Earth app.

36:00 [APPLAUSE]

36:05 Now, this is possible because the app

36:07 is making its content available based

36:09 on its user's previous actions.

36:10 We just showed you this with Google Earth

36:12 that any app that utilizes this new API

36:15 will have the same capability.

36:16 For developers, we think this is a great way for you

36:19 to help your users rediscover content right when

36:21 they're looking for it.

36:23 And with that, I'll hand it back to Dave,

36:24 who is going to take you through some more of the enhancements

36:26 you can look forward to in L.

36:28 [APPLAUSE]

36:34 DAVE BURKE: Thanks, Avni.

36:36 So we've covered some of the highlights of the user

36:38 experience.

36:39 But there's lots of other user experience improvements in L,

36:41 for example, a new keyboard UI, a Do Not Disturb

36:44 mode, new quick settings, and much, much more.

36:46 But in the interest of time, let's move

36:48 on to the second major theme of L, and that's performance.

36:52 Let's start with the Android virtual machine.

36:55 So you might remember that we made

36:56 a very early version of our new runtime,

36:59 ART, available as a developer option in KitKat.

37:02 Well, we got some really great feedback

37:03 from you guys, as well as some excellent open source

37:05 contributions from ARM and Intel and MIPS.

37:09 And I'm excited to say that we're finally

37:10 ready to pull the trigger on this bad boy,

37:12 because the L release run exclusively on the new ART

37:15 runtime.

37:16 [APPLAUSE]

37:21 So we wrote ART from the ground up to support a mix of Ahead

37:24 of Time Compile, Just in Time Compile, and interpreted code.

37:27 And it's truly cross platform.

37:29 So it supports ART, x86, and MIPS.

37:32 We put a lot of effort into optimizing ART's back end

37:36 compilers.

37:37 And this has resulted in a 2x improvement

37:39 performance over Dalvik.

37:41 And best of all, this one is on us.

37:43 You don't have to make a single change.

37:45 All of your app code just gets the performance improvement

37:47 for free.

37:49 [APPLAUSE]

37:54 ART also has a brand new garbage collector and memory allocator.

37:57 So this dramatically reduces the number of pauses

38:00 and the duration of pauses associated

38:02 with a garbage collection event.

38:04 As a result, your app runs more smoothly.

38:06 So if you take a look, for example,

38:07 at Google Maps on both Dalvik and ART,

38:10 firsts you'll notice a number of pauses

38:12 have reduced from two to one.

38:14 But also, the pause duration has reduced

38:16 from roughly 10 milliseconds down to about two

38:19 to four milliseconds.

38:20 So now, it fits comfortably in a vsync window--

38:22 no more application stutters.

38:26 [APPLAUSE]

38:30 And there's more.

38:31 ART doesn't just bring better performance.

38:33 It's also more memory efficient.

38:34 So it's smart about when the app is

38:36 put into the background, in which case

38:38 we'll apply a slower but more intensive

38:41 moving collector to save anything from hundreds

38:43 of kilobytes to many megabytes.

38:46 And finally, ART is fully 64-bit compatible.

38:49 In fact, we've adapted and optimized the entire platform

38:53 to take advantage of new 64-bit architectures.

38:56 So now, you can benefit from larger number of registers,

38:59 newer instruction sets, and increased memory addressable

39:02 space.

39:03 [APPLAUSE]

39:09 So to take advantage of 64-bit, we've

39:12 added support for new ABIs in the NDKs, so ARMv8, x86-64,

39:17 and NIP 64.

39:18 And of course, if your app is written in Java,

39:20 then it will work with absolutely no modification

39:23 on u64bit hardware.

39:26 OK, so that's CPU performance.

39:28 The other side of the coin is GPU performance, graphics.

39:31 And I'm really excited about some of the things

39:33 that we're doing in L in this area.

39:35 So historically, mobile graphics has lagged desktop

39:39 by virtue of the fact that mobile GPUs are

39:41 smaller and more power constrained.

39:44 But that's changing quickly.

39:45 Mobile GPU performance is catching up

39:47 with console graphics and even PC graphics.

39:50 So in L, we specifically wanted to close

39:53 the gap between desktop DX11 class

39:55 graphics capabilities and mobile.

39:58 And we're doing that with something we

39:59 call Android extension pack.

40:02 So we set out to work with GPU vendors,

40:04 including NVIDIA, Qualcomm, ARM, and Imagination Technologies.

40:09 And together, we defined the Android extension pack.

40:12 So it's a set of features that includes things

40:14 like tessellation geometry shaders, is compute shaders,

40:17 and advanced ASTC texture compression.

40:20 So let's take a look at the Android extension

40:22 pack in action.

40:24 And what you're about to see is Epic's Unreal Engine 4 40:28 desktop rendering pipeline running

40:30 on Android L on the latest NVIDIA tablet hardware.

40:34 Now, the Android extension pack enables much more advanced

40:37 shaders.

40:37 So we can have more realistic environments,

40:39 more realistic characters--

40:40 [LOUD BOOM]

40:41 --and vastly improved lighting.

40:42 So let's go start this up.

40:43 [VIDEO PLAYBACK]

40:47 [CRASH]

40:50 [HEAVY BREATHING]

40:52 [LOUD BOOMING SOUND]

40:57 [LOUD BOOMING SOUND]

41:02 [GRUNTING]

41:05 [DRUMMING]

41:07 [GRUNTING]

41:08 -You wanna play?

41:09 [HEAVY BREATHING]

41:11 -OK.

41:12 [DRUMMING]

41:17 [CHICKENS CLUCKING]

41:18 [DRUMMING]

41:24 [CRASHING SOUND]

41:26 [CHICKENS CLUCKING]

41:27 [END VIDEO PLAYBACK]

41:28 [APPLAUSE]

41:31 DAVE BURKE: OK.

41:32 So, as I mentioned, this isn't just a cut sceen.

41:35 It's actually live.

41:36 And we can fly through the world.

41:38 Some of the rendering that you saw there was truly incredible.

41:41 So there were really amazing reflections

41:42 in the water, lighting effects.

41:44 Tessellation were being used for the smoke affects.

41:47 And starting with the L release in the fall,

41:49 you're going to see new, high-end tablets and phones

41:52 shipping on Android with this level of graphics capabilities.

41:55 So quite literally, this is PC-gaming graphics

41:57 in your pocket.

42:00 The last performance enhancement I want to take you

42:02 through is on battery.

42:03 And we've worked hard to make sure

42:05 that the battery keeps up with the performance.

42:07 And of course, there are a variety

42:08 of systems and components that tax the battery

42:10 on a modern phone or tablet, so WiFi radios, cell radios, GPS,

42:14 CPU, et cetera.

42:17 And you might remember we've had some previous efforts

42:20 to improve quality on other releases--

42:21 so Project Butter for UI smoothness

42:23 in Jelly Bean; Project Svelte for memory footprint in KitKat.

42:27 Well, on the same team, and brought to you

42:29 by those same project naming geniuses,

42:32 we have Project Volta.

42:34 And the goal of Project Volta is to optimize

42:37 how the expensive subsystems of the devices are used

42:39 and to improve overall battery life.

42:42 So the first thing we did was improve

42:44 our instrumentation of battery data.

42:46 You can't improve unless you can measure.

42:49 So we created the tool that we call Battery Historian.

42:52 And it helps you visualize on a time axis the battery usage

42:56 information.

42:57 Now you can correlate battery discharge

42:59 with what was happening to the device at the time.

43:02 [APPLAUSE]

43:03 So, on a Nexus 5 running on Battery Saver mode,

43:06 you can extend your battery life by up to 90 minutes of usage

43:09 within a typical single day's use.

43:11 So, I just gave you a quick, whirlwind tour

43:13 of some of the highlights of L, how we're improving the user

43:16 experience through steps like improved design,

43:18 smarter notifications, and intuitive authentication,

43:22 and also the enhancements on the performance side,

43:24 so faster runtime, better graphics,

43:26 and stronger battery performance.

43:28 But I only scratched the surface of L.

43:30 And as I mentioned at the start, this

43:32 is our biggest release to date.

43:34 You're going to find things like better multitasking, Bluetooth

43:36 4.1, burst mode camera APIs, USB audio support, and much,

43:40 much more.

43:42 Tomorrow morning, we're going to be making the L developer

43:44 preview STK available from developer.android.com

43:47 and also posting early system images for the Nexus

43:51 5 and Nexus 7 so you can start developing for L today.

43:54 [APPLAUSE]

44:01 So with that, let me hand back to Sundar.

44:03 Thank you.

44:03 [APPLAUSE]

44:11 SUNDAR PICHAI: Thank you, Dave.

44:13 As Dave said, the L release with 5,000 new APIs

44:16 is one of our most comprehensive.

44:18 And we're very excited to be sharing it today.

44:21 We have a whole new design with L, tons of UX features,

44:25 and a whole slew of performance improvements.

44:29 When you take a step back and you

44:30 look at what we are doing with Android,

44:33 the approach we are taking is very unique and distinctive.

44:37 We aren't building a vertically integrated product.

44:41 What we are doing is building an open platform at scale.

44:46 We work with hundreds of partners

44:48 globally to bring a product and a platform that

44:52 touches billions of people.

44:54 And we want to do it in a way in which we are innovating

44:57 at a very, very fast pace.

45:00 If you take a look at the innovation

45:01 that's happening in Android, and if you

45:04 look at some of the recent announcements from others,

45:06 you can see that things like custom keyboards, widgets--

45:11 those things happened in Android four to five years ago.

45:14 [APPLAUSE]

45:19 We are working very, very hard to bring open platform

45:25 and innovate on it at an unprecedented scale.

45:28 We want to make sure we ship these features to users

45:30 as fast as possible.

45:32 That's where Google Play services come in.

45:35 Google Play services ships every six weeks.

45:39 And 90% of our users are on the latest version of Google Play

45:44 services across all versions of Android.

45:46 [APPLAUSE]

45:49 In fact, by shipping every six weeks, we in many ways

45:53 can iterate faster than typical OS release cycles.

45:57 While it's open platform, and we want to innovate fast,

46:01 we want to make sure it's very, very secure as well.

46:03 So we take security very seriously.

46:06 Let's take an example at malware production.

46:08 In Google Play, we automatically scan every single application

46:13 for malware.

46:14 And if users opt in, we even scan applications from outside

46:18 of Google Play to make sure they are malware free.

46:21 Given the popularity of Android, there's

46:23 a whole vested industry, given there's

46:25 a lot at stake around security.

46:27 But based on every data we see, well,

46:29 well less than half a percent of uses ever run

46:33 into any malware issues.

46:35 And increasingly, we are pushing security updates

46:38 through Google Play.

46:40 Any security updates related to Google server communications,

46:43 we are now pushing those updates through Google Play services

46:46 so that we can get them to users within six weeks.

46:51 With L, we are also launching factory reset protection,

46:54 so that if your phone get stolen,

46:56 users have full control to disable their phones.

47:00 [APPLAUSE]

47:05 Finally, privacy is an important part of security.

47:09 So with L release, for the first time

47:11 we have a centralized setting, what

47:13 they call universal data controls,

47:15 where users can go and manage their important privacy

47:18 protections.

47:19 They can control data that is shared from the device,

47:23 like location history, et cetera.

47:25 And so we are doing that in L as well.

47:27 [APPLAUSE]

47:31 So far, we have been talking about L release

47:34 in the context of mobile phones and tablets.

47:38 But users increasingly are living in a multi-screen world.

47:43 You are using other connected devices,

47:46 the television in your living room.

47:48 You're increasingly wearing things on your body.

47:52 When you get into your car, you expect a connected experience.

47:55 We want to work to create a seamless experience across all

47:59 these connected devices.

48:01 So with L, as well with Chrome, we

48:04 started laying some foundational principles

48:07 on how evolve our platforms to support

48:09 these new connected experiences.

48:11 So here are a few principles.

48:13 We are making everything contextually aware.

48:17 We want to understand whether you're home with your kids

48:19 and you want to be entertained or you're

48:21 work trying to be productive.

48:23 Or maybe you're traveling.

48:25 We want to bring the right information to you

48:27 at the right time.

48:29 We want the experience to be voice enabled.

48:32 We are building the most advanced voice recognition

48:34 infrastructure in the world, and we

48:36 want to help users interact with computing

48:39 devices in an intuitive way.

48:41 For example, when they're driving or cooking,

48:43 we want voice to be a major source of input.

48:46 We want the experience to be seamless.

48:49 It shouldn't matter which device you were using before.

48:51 We want to pick up where you left off.

48:54 And finally, users always have their smartphone.

48:58 So we want to make sure all these connected experiences

49:01 work based on your smartphone, be it your wearables,

49:04 be it your car, or like, we have shown with Chromecast,

49:07 be your television.

49:09 So, both with L release and Chrome,

49:13 we are bringing a whole set of new experiences

49:15 to many connected screens around you.

49:18 The first area we are going to talk to you about is wearables.

49:22 About three months ago, we launched

49:25 our preview of Androidwear.

49:27 We announced a developer SDK, and the reception

49:29 has been very, very positive.

49:31 To give you further update, I'm going

49:33 to invite David Singleton on to the stage.

49:36 [APPLAUSE]

49:42 DAVID SINGLETON: We're right at the beginning

49:44 in a new phase in the miniaturization of technology,

49:48 which means that it's finally possible to make

49:50 a powerful computer small enough to wear comfortably

49:53 on your body all day long.

49:56 And there's a huge opportunity to bring rich user experiences

49:59 to these devices.

50:01 And that's why we're building Androidwear as our platform

50:04 for wearables based on Android.

50:07 Androidwear makes it easy for developers

50:10 to reach users on this new form factor using

50:13 precisely the same tools we're already

50:16 familiar with on Android phones and tablets.

50:21 People will be wearing these small, powerful devices,

50:24 so style is important.

50:26 And that's why Androidwear supports

50:28 both square and circular screens.

50:31 And we think that there will be a wide variety

50:33 of fashionable designs.

50:36 Sensors will help them understand your context.

50:39 So they can provide useful information when you need it

50:43 and help you reach your fitness goals.

50:45 And as the device that you always have with you,

50:48 your watch will also provide intelligent answers

50:50 to spoken questions and as Dave showed us earlier,

50:54 act as your key in a multi-screen world.

50:58 Across the world, people check their Android phones

51:01 an average of 125 times every day.

51:07 And that's why we've designed Androidwear to quickly show

51:09 you relevant information and make sure

51:11 you never miss an important message,

51:13 while letting you stay engaged with the people

51:15 that you're actually with.

51:17 We do this by working to understand the context of what

51:21 you care about, while enabling very

51:23 brief interactions with the device.

51:26 Here's a live demo on the LGG watch.

51:30 You can see that it has an Always On display,

51:32 than at any given time, it shows you the most important thing we

51:36 for you.

51:38 So Jeff, it looks like your flight

51:40 to Brazil for the World Cup is on time.

51:43 I guess you do deserve a break after this big demo.

51:46 And if Jeff wanted to see more, he

51:47 can simply raise his watch of tap the screen

51:50 to switch into vibrant, full color

51:52 that you're already seeing here.

51:54 Throughout the day, if Jeff receives a notification which

51:57 buzzes his phone, his watch will vibrate on his wrist

52:00 and show him what's up at a glance.

52:02 So he won't miss an important message like this one.

52:06 Swiping up and down navigates you

52:08 through this stream of cards, which includes information

52:11 from Google Now, apps running on Jeff's phone,

52:14 and apps running directly on the wearable itself.

52:18 And when there's a page indicator,

52:20 Jeff can swipe horizontally to see more details.

52:24 You can see that we've applied material design here.

52:26 The cards float above beautiful, textured backgrounds.

52:30 And just like in your phone's notification shade,

52:35 you can swipe a card away to remove it from your stream.

52:37 Let's take a look at Jeff's phone.

52:39 And that notification has disappeared.

52:42 Back at the watch face, pressing and holding

52:46 lets you choose a different one.

52:51 You can see that there's a broad selection

52:53 of analog and digital designs in a variety of styles

52:56 to suit your tastes.

52:59 OK, now that we're acquainted with the overall UI model,

53:03 let's see how Androidwear can work for you.

53:06 Imagine that Jeff has just got up in the morning.

53:08 He swipes up and sees the weather forecast for the day.

53:12 His commute's not looking too bad.

53:15 And oh look, Jeff, I guess you need that package for your trip

53:18 to Brazil.

53:19 You better not forget to pick it up.

53:21 JEFF: OK, Google.

53:22 Remind me to check my mailbox when I get home.

53:25 DAVID SINGLETON: Now If we can see Jeff's phone

53:27 at the same time, you'll see that this is immediately

53:30 synced across.

53:31 [APPLAUSE]

53:36 DAVID SINGLETON: And in this case,

53:38 his watch was smart enough to know where home is.

53:42 A little later on, as Jeff is arriving at the office,

53:45 his watch vibrates again with a chat message

53:47 from one of the team.

53:49 He can see who it's from and what he's saying, all

53:52 without having to fumble around and get out his phone.

53:57 You're watching your phone stay in sync.

54:00 When you swipe away a notification on the watch,

54:02 it disappears from the phone, as Jeff is showing now.

54:08 [APPLAUSE]

54:12 It's super convenient.

54:14 In the evening, Jeff is having dinner

54:16 with a friend at a restaurant.

54:18 If he's unfamiliar with one of the ingredients on the menu,

54:21 he can just say--

54:23 JEFF: What is limburger?

54:27 DAVID SINGLETON: So it looks like limburger

54:28 or is a type of cheese.

54:30 Jeff is lactose intolerant, so he better

54:32 order something different, or this dinner could go wrong.

54:36 And when Jeff receives a phone call, his watch will vibrate,

54:39 and he can see who's calling at a glance.

54:42 It's another one of Jeff's co-workers.

54:44 Now Jeff could get out his phone to answer, but since he's busy,

54:48 he can either swipe to reject the call from his wrist

54:52 or swipe up to choose from one of these quick SMS replies.

54:55 His phone sends the SMS, and he's done.

54:59 [APPLAUSE]

55:05 Sometimes you're enjoying dinner so much that you

55:07 want to avoid any more interruptions.

55:09 And for that, you can set Do Not Disturb

55:12 with a single downward swipe from the top of the screen.

55:16 [APPLAUSE]

55:18 And now Jeff's watch won't buzz again until he wants it to.

55:23 Later that night, Jeff arrives home.

55:26 Oh, that's right.

55:27 Your package is here.

55:28 Now that he's at home, the reminder

55:30 that Jeff created this morning has triggered.

55:34 You can also use Androidwearables

55:35 to control other devices around you.

55:38 Let's loosen up with a bit of music.

55:40 JEFF: Play some music.

55:45 DAVID SINGLETON: Now you'll see that Jeff

55:46 has music controls on his watch.

55:48 [MUSIC - CHROMEO, "JEALOUS (I AIN'T WITH IT)"]

55:49 He can see what song is playing.

55:51 He can pause the music or skip to the next track.

55:54 And while it's playing, the album art

55:56 is beautifully displayed right there on his wrist.

56:01 Finally, at the end of the day, it's time for bed.

56:06 JEFF: Set an alarm for 7:00 AM.

56:11 DAVID SINGLETON: With glanceable notifications and quick voice

56:14 actions, Androidwear gives you what

56:16 you need right when you need it.

56:18 Let's take a closer look at some of the contextual information

56:22 that Androidwear provides when you're traveling.

56:24 So Jeff's about to leave on that big trip to the World Cup.

56:28 It's the morning of his flight.

56:29 So his phone is already displaying relevant information

56:32 for his trip.

56:34 He can see his flight status and even show his boarding pass.

56:39 His hotel address will be there when he needs it.

56:42 And he knows whether or not he'll need to pack an umbrella.

56:45 It does look like it's going to rain in Brazil on Friday.

56:48 Once he's in Brazil, Androidwear continues

56:52 to give him useful, timely information

56:54 at a glance, whether it's his restaurant

56:57 reservation, the time back at home

57:00 so he knows when to call as family,

57:02 or the local bus schedule.

57:04 And while he's walking around the city,

57:07 Jeff can see how many steps he's taken today,

57:09 along with a step count history for the week.

57:13 On devices that support it, he can even

57:15 check his heart rate after a jog.

57:18 [APPLAUSE]

57:24 So we've shown you what Androidwear

57:25 can do out of the box.

57:27 We're even more excited to see what developers

57:30 build on top of this platform.

57:33 The Androidwear SDK enables you to build

57:36 glanceable, contextual apps for this new category of device.

57:40 Let's talk through the capabilities

57:41 it gives to developers.

57:43 And then we'll show some examples.

57:45 Right off the bat, Androidwear automatically bridges

57:48 notifications from your Android phone

57:50 or tablet directly to your watch.

57:53 Now, Android's notification APIs already

57:56 allow you to build beautiful user interfaces

57:59 with big pictures, actions, and more.

58:03 And there are hundreds of thousands

58:04 of apps delivering billions of these notifications every day.

58:09 And now, they're available on your wrist.

58:13 Back in March, we released a developer preview, enabling

58:16 apps running on the phone to add things like voice replies,

58:20 have several pages, and group notifications in bundles.

58:24 With these additions, you can begin

58:26 to provide a tailored experience for wearables.

58:30 And we've used these features to add wear support

58:32 to Google apps, like Hangouts and Gmail.

58:36 And there's been a huge response from developers.

58:39 The very best wearable apps respond to the user's context,

58:44 put glancable cards in the stream,

58:46 and allow the user to take direct action

58:48 in just a few seconds.

58:50 Here's one of my favorite examples.

58:53 With Pinterest, you can follow other people's pins.

58:57 Pinterest app will let you know when you're near a place that's

59:00 being pinned by someone you follow.

59:03 So Jeff's friend Susie loves Korean barbecue.

59:06 And she's somewhat of an authority

59:07 on the best restaurants in San Francisco.

59:10 So when Jeff is in the city, Pinterest

59:13 can notify him that he's near one

59:15 of Susie's pinned restaurants.

59:17 The notification will appear on his wrist just like this.

59:20 And it uses pages, allowing him to quickly glance

59:23 at the details, then swipe to see a map.

59:25 And if he like it, he can start navigation right

59:28 from his wrist.

59:31 This is using Google Maps for mobile,

59:33 which gives you turn by turn directions on your watch.

59:36 It's particularly useful when you're walking.

59:39 And it works with all Android Wear devices.

59:43 In addition to what's possible with notifications bridged

59:45 from the phone, today we're making a full Android Wear

59:49 SDK available which enables you to write

59:52 code-- It's pretty great.

60:01 It enables you to write code that runs directly

60:03 on the wearable itself.

60:05 And almost all the API's that you're already

60:08 familiar with on Android are available here.

60:15 That means that you can present fully customized UI,

60:18 read sensors directly, and much, much more.

60:22 We're also introducing a new set of API's and Google Play

60:24 services that makes it easy for your app

60:27 to send data between a phone or tablet and a wearable.

60:31 And we've road tested these API's with some developers

60:33 over the past few weeks.

60:35 Let's take a look at examples of what they built.

60:39 Eat 24 is an app that makes food ordering both fun and easy.

60:44 Now watch this.

60:45 Hopefully I'm going to order a pizza in 20 seconds.

60:49 When it comes to take out, I'm a creature of habit.

60:52 And Eat 24 has recognized this and takes

60:55 advantage of that contextual stream.

60:57 Around the same time I made an order last week

61:00 it puts a notification suggesting I order again.

61:04 I can tap on the notification and launch

61:06 into their full screen UI.

61:09 And here I'm presented with a beautiful interface that

61:12 lets me confirm the kind of food I'd like today,

61:15 let's stick with pizza.

61:17 And then I can quickly swipe to see and repeat my last order.

61:21 Just one more tap to pay, and the pizza's on its way.

61:34 I think that clocked in under 20 seconds.

61:37 Now you might be wondering how this got to my watch.

61:41 Well all I had to do was install the Eat 24 app

61:44 from the Play store on my phone.

61:47 When a watch is connected, the wearable portion of the app

61:50 is automatically installed and kept up to date on that watch.

62:01 I mentioned the new wearable API's

62:03 for easy communication between phone and watch.

62:07 All the Cooks is a social recipes app which has made

62:10 really great use of these API's.

62:13 I don't know about you, but I find it really hard

62:15 to follow recipes, especially when

62:17 it gets to those tricky bits where everything's

62:19 happening at the same time.

62:20 So wouldn't it be more convenient if I could just

62:22 look down at my watch and see what to do next?

62:25 With the All the Cooks app I can choose a recipe.

62:29 Let's go into my favorites and choose this beef brisket chili.

62:34 The recipe will immediately appear on my watch.

62:36 So it's always right there with me.

62:38 Let's get started.

62:42 I've got all the ingredients, so let's start

62:44 following the steps.

62:45 Now watch the phone carefully.

62:47 As I move from step to step, the phone stays in sync too.

62:57 And if you're wondering whether or not

62:58 it's safe to wear your watch while cooking,

63:01 it's great to know that all the devices we're

63:03 talking about today are water resistant.

63:10 And with All the Cooks, whenever a recipe calls for a timer,

63:13 like this four hours in the oven,

63:15 I can do that right away on my wrist.

63:22 So no more burnt dinner.

63:25 We saw some great examples of voice actions earlier today.

63:29 And we believe voice actions will

63:30 be most useful when they can invoke

63:32 the best service in any app.

63:35 We're just getting started with this,

63:36 but we're making voice available for some key actions

63:39 on the wearable today and we'll be adding more

63:42 over the coming months.

63:44 Lift is a transportation service and ride sharing

63:47 app that allows you to request a car

63:49 to pick you up at your exact location.

63:52 Lift have implemented our call a car intent.

63:55 So it's really easy to just walk outside and say, "OK, Google,

64:00 call me a car."

64:05 You'll see that Lift is able to determine Jeff's exact location

64:08 from his phone an presents this confirmation

64:10 screen so he can verify his address.

64:13 The app is also made great use of notifications in the stream.

64:16 You can see when your car has arrived,

64:18 keep up to date throughout the journey, and even rate

64:21 your driver right from your wrist

64:22 when you're at your destination.

64:25 Thanks to all our developers.

64:35 Now, we showed a preview of a couple of

64:37 watched we were working on with our partners back in March.

64:41 The LGG watch will be available to order

64:45 later today on the Play store.

64:53 In addition, you might have caught

64:55 a glimpse of a new device during the demos.

64:57 We're very happy that Samsung is joining the Android wear

65:01 family with the Samsung Gear Live.

65:09 And the Samsung Gear Live is also

65:11 available to order later today.

65:19 The Moto 360 is the first watch to adopt the round Android Wear

65:23 UI.

65:24 And it will be available for sale later this summer.

65:28 Those are just the first three watches.

65:31 There are many more on the way, and we're

65:33 thrilled to enable developers across the world

65:37 to build apps for what we believe

65:39 will be a revolutionary new form factor.

65:42 And now, I'd like to invite Patrick Brady on stage

65:45 to tell you about how we're bringing Android to the car.

65:50 PATRICK BRADY: Thank you, David.

65:52 Thank you. isn't that great?

65:55 Android Wear creates a seamless experience

65:59 by connecting your Android smartphone

66:01 to a wearable device.

66:03 And the result is truly amazing.

66:06 Wouldn't it be great if all of your devices

66:08 were this connected.

66:10 For many of us, cars are an integral and essential part

66:14 of life.

66:15 They bring us to the grocery store,

66:17 and take us on weekend trips.

66:19 They bring us to work, and take us home.

66:22 In fact, in the United States, the average commuter

66:26 spends over one hour in the car every day.

66:29 In many ways, our cars keep us connected to the physical world

66:33 around.

66:34 But they remain disconnected from our other devices

66:37 in our digital lives.

66:39 So what have drivers done to bridge this divide?

66:42 Well even though it's unsafe, and in many cases illegal,

66:46 people use their phones while driving.

66:49 And reports show that 25% of accidents in the US

66:53 are caused by people fumbling with gadgets behind the wheel.

66:57 There's got be a better way.

66:59 So back in January we announced the open automotive alliance

67:03 to address this problem and make the connected car a reality.

67:08 We'd like to show you what we've all been working on.

67:11 And today, we're happy to announce Android Auto.

67:22 We've re-designed the Android platform for automotive,

67:25 making it easier and safer to use the connected apps

67:29 and services drivers want in the car.

67:32 We looked at what people do with their phones in the car today.

67:35 And these things stood out to us.

67:38 Navigation, communication, music,

67:41 and other forms of streaming media.

67:44 Android Auto puts these front and center.

67:46 So you don't have to go hunting through a grid of icons

67:49 to find the apps that are most important to you

67:51 when you're in the car.

67:53 Android Auto is contextually aware

67:55 to give you the right information

67:57 right when you need it.

67:59 And most importantly, Android Auto

68:01 is completely voice enabled, so that you

68:04 can keep your hands on the wheel,

68:06 and your eyes on the road.

68:08 You know, we really wanted to drive a car up here on stage

68:12 and show you this live in action.

68:15 But apparently there these regulations and logistics

68:18 that make driving a vehicle in a room packed with 6,000 people

68:22 a very hard thing to do.

68:25 So we set one of our engineers on the problem.

68:28 And apparently, this is what happens

68:30 when engineers have access to a blow torch.

68:36 So we're down one test car, but we

68:39 have a great demo cockpit to show you.

68:41 And now I'm happy to introduce Andy Brenner, our product

68:44 manager, who will literally drive this demo.

68:52 So to start, Andy connects his Android phone to the car.

68:57 And the phone casts the Android Auto experience

68:59 to the car's screen.

69:04 Andy can now put his phone down and used the familiar car

69:07 controls, steering wheel buttons, console dials,

69:11 and touch screens to control Android Auto.

69:14 It looks and feels like it's part of the car.

69:17 But all of the apps we see here are running on Andy's phone.

69:21 Which means that the experience gets better when Andy updates

69:24 his apps, or gets a newer, faster phone.

69:28 This also means that Andy has a personalized experience that he

69:31 can bring with them into any compatible car.

69:35 The first thing Andy sees is the overview screen

69:39 which shows personal and contextually relevant

69:42 destinations, reminders, contacts,

69:46 and music from Google Now another apps.

69:49 One tap and he's navigating, or listening to his favorite road

69:52 trip mix.

69:54 Andy, why don't you play us some music?

70:01 [MUSIC - THE MOWGLI'S, "SAN FRANCISCO"]

70:12 Let's look for a second at Play music.

70:14 It has been adapted to have simple, glanceable controls

70:17 for the car.

70:18 Andy has access to all of his curated playlists, radio

70:22 stations, albums and artists.

70:24 And to all the key features in Google Play Music.

70:27 He can also use voice or the steering wheel

70:29 controls to control the music in the car,

70:32 keeping his hands on the wheel.

70:34 Fantastic.

70:36 Of course, Android Auto needs great maps and navigation.

70:41 So let's show you Google Maps.

70:45 We all love Google Maps because it's fast, accurate, updated,

70:49 and it seems to know where everything is.

70:52 In Android Auto, drivers have access

70:55 to all their favorite maps features.

70:57 Great local search, personalized suggestions,

71:01 live traffic, and of course, turn by turn navigation.

71:06 And Google Maps for Android Auto is even more powerful,

71:09 because it is completely voice enabled.

71:13 Andy, why don't you take us for a drive?

71:18 ANDY BRENNER: How late is the de Young Museum opened today?

71:24 GOOGLE: De Young Museum is open from 9:30 a.m.

71:27 to 5:15 p.m. on Wednesday.

71:29 ANDY BRENNER: Oh good, I can go there.

71:36 Navigate there.

71:40 GOOGLE: Navigating to de Young museum.

71:45 Head for 4th street, northeast on Minna St. In 600 feet

71:50 use any lane to turn right onto 4th street.

71:54 PATRICK BRADY: So Andy was able to start navigation

71:56 without ever entering an address or taking

71:58 his hands off the steering wheel.

72:00 During navigation, instructions are spoken, as you heard,

72:04 and displayed on the screen in a material

72:07 car that floats above the map.

72:09 Great.

72:11 So that's music and navigation.

72:13 What's next?

72:15 Let's show you voice enabled messaging.

72:23 GOOGLE: New message from Hiroshi Lockheimer.

72:26 Here it is.

72:27 Andy, are we there yet?

72:31 PATRICK BRADY: As you can see, incoming messages

72:33 show up as heads up notifications.

72:35 So Andy can still see the upcoming turn in Maps.

72:39 When he's ready, he can just use the steering wheel voice button

72:42 to reply.

72:46 ANDY BRENNER: Reply.

72:49 GOOGLE: What's the message?

72:51 ANDY BRENNER: I have no wheels.

72:54 GOOGLE: Here's your message to Hiroshima Lockheimer,

72:56 I have no wheels.

72:57 Do you want to send it?

73:00 ANDY BRENNER: Sure.

73:02 GOOGLE: Sending message.

73:11 PATRICK BRADY: So we're really excited to bring

73:13 these great experiences into the car.

73:16 But we also want you, our developers,

73:18 to come along for the ride.

73:20 We know it's not easy to build apps for cars today.

73:23 There are dozens of different car platforms, input controls,

73:27 and user interfaces.

73:28 There is no central way to distribute your app,

73:31 or keep it updated.

73:33 Wouldn't it be great if building an app for the car

73:35 was just like building an app for your smartphone or tablet?

73:38 Well, we have good news for you.

73:41 The road ahead is brighter, and today we're

73:43 announcing the Android Auto SDK.

73:46 So that you-- We thought you'd like that.

73:54 So that you can just focus on making great apps for the car.

73:58 We're starting with a full set of API's

74:00 for audio and messaging applications.

74:03 First, let's talk about audio.

74:05 We worked with a great set of developers

74:08 on a prereleased version of the Android Auto SDK

74:11 to develop some great audio streaming

74:13 apps that let you listen to music, internet radio, news,

74:17 sports, and podcasts on the go.

74:20 You can try these apps out live in our demo cars right outside.

74:25 Next, let's talk about messaging apps.

74:28 Andy showed us earlier how he can send text messages using

74:32 Android Auto, completely with his voice.

74:35 Well we're opening this up to your messaging apps.

74:38 So using these API's your apps can

74:41 notify users of incoming messages

74:45 and allow them to respond using voice.

74:47 And this is the same API we're using for notifications

74:50 and remote reply on Android Wear.

74:53 With just a few lines of code, you

74:56 can let users know on their wrist or in their car.

74:59 it's really, really powerful.

75:02 So we're really excited about Android Auto

75:04 and we think we've found that better way.

75:06 But I know what your all thinking,

75:09 when some rubber actually meet the road?

75:11 Well, we're happy to say that you won't have to wait long.

75:16 The Android Auto SDK will be published soon.

75:19 And the Android Auto experience will be available to users

75:22 with the public L release, later this year.

75:25 And the excitement in the auto industry

75:27 is really been growing.

75:29 Today, we're happy to announce that over 40 new partners have

75:32 joined the Open Automotive Alliance.

75:41 Over 25 car brands have signed up

75:43 to ship Android Auto in the near future.

75:46 What's more, the first cars with Android Auto

75:49 will be rolling off dealer lots before the end of this year.

75:57 So that's just a peek at Android Auto, an Android experience

76:01 that's been redesigned for the car,

76:03 with all the apps drivers know and love,

76:06 through an interface that's built for drive.

76:08 Now I'd like to welcome Dave Burke back

76:10 on stage to tell us about Android in the living room.

76:19 DAVE BURKE: Thanks Patrick.

76:20 It's pretty cool to see what you guys are doing at Autos,

76:22 but some of us don't actually have a car in our living room,

76:25 wheels or not.

76:25 So I'm going to talk about a different form

76:27 factor and that's TV.

76:29 So TV's are fast becoming smarter, more connected.

76:33 And really, they're becoming computing devices

76:35 in their own right.

76:36 So we see a great opportunity to bring

76:38 some of the strong capabilities of Android, such as voice

76:41 input, user experience and content

76:44 to the largest screen in your house.

76:47 Now in some ways, TV space is not

76:49 too dissimilar to the mobile space in 2006.

76:53 Each TV manufacturer has a different OS

76:55 with different API's and programming model,

76:57 often with limited developer tools.

76:59 And the cost and friction to develop a service

77:01 to run across multiple TVs is too expensive.

77:05 As a result, smart TVs are typically limited

77:07 and not competitive with their mobile cousins.

77:10 So we wanted to go and change that.

77:12 Today, we're announcing Android TV.

77:22 So, this isn't a new platform.

77:24 That's kind of the point.

77:25 We're simply giving TV the same level of attention

77:28 as phones and tablets have traditionally enjoyed.

77:31 We want you to be able to leverage your existing skills

77:33 and investment in Android, and extend them to TV.

77:37 There's now one Android SDK for all form factors.

77:44 Now, remotes are a core part of the TV experience.

77:47 And Android TV requires just a D-pad with voice input.

77:51 And that can be made available as a hardware remote control,

77:54 as a game controller, or even a virtual controller on a phone

77:57 or tablet.

77:58 So today, I'm going to use the Android TV app on my phone.

78:03 And the best way to understand Android TV

78:05 is to just see it in action.

78:07 So what you're about to see is hot off the press, and really

78:10 just an early look at the TV support

78:12 that we're adding to the L developer preview.

78:15 OK, so let's start with the most integral part of television,

78:18 live TV.

78:22 So in L, we've added what we call the TV input

78:26 framework to Android.

78:27 So it enables Android-based TVs to handle video

78:29 from sources such as HDMI, TV tuners, and IP TV receivers.

78:34 And the UI provides a unified view of your channels

78:36 in a familiar channel hopping UI with the channel

78:39 information on the top.

78:41 Now, if you want to do something different,

78:43 just like every other Android device, you press home.

78:46 And you'll notice that home overlays on top of the content.

78:50 So I can keep watching while I browse.

78:52 But unlike phones and tablets, where the behavior

78:54 is more task based, we designed home

78:57 to be a super simple, lean back experience.

79:00 Because TVs, unlike computers or mobile devices,

79:03 they're primarily entertainment interfaces.

79:05 Users don't expect or want complexity from their TV.

79:09 So the launcher presents you with a set

79:10 of content recommendations at the top,

79:12 floating over the UI using that familiar material theme.

79:15 As I scroll down you get immediate access

79:18 to your applications, ordered by how often you use them.

79:21 Scroll down again, you get access

79:23 to your apps, also ordered by usage order.

79:27 Now if I scroll back up to the content recommendations

79:30 you can see this is a quick way for me to watch content.

79:33 The recommendation system is completely open.

79:35 Any app can publish to it, and it's

79:37 ranked according to your usage patterns.

79:39 So for example, I'm currently binge watching Game of Thrones.

79:42 I am actually.

79:43 And I'll automatically be presented

79:45 with a recommendation for the next episode, like so.

79:49 So that's the home.

79:50 Let's talk about search.

79:52 Today, people regularly take out their phone

79:54 to search for something to watch.

79:56 With Android TV, we decided to build a core search

79:59 functionality, directly into the experience, powered by voice.

80:03 So for example, I could just simply say, Breaking Bad.

80:12 Google will interpret the results,

80:14 and get me a result for the popular TV show.

80:16 Now with one click, I can then watch it

80:18 in Google Play movies and TV, or any other service

80:20 that I have installed.

80:22 If I scroll down, you'll see information on cast members.

80:25 Scroll down again, I get related search terms, also

80:28 YouTube clips at the bottom.

80:30 Now, I can also pivot on cast members.

80:32 So for example, I can click on Anna Gunn,

80:35 I'll get that nice material transition,

80:36 I'll get information on the actress.

80:38 Scroll down, I can get movies and TV shows

80:41 that she's starred in.

80:42 Even YouTube clips of interviews with the actress.

80:46 Now, the power of Google comes into its own

80:48 for more abstract queries.

80:49 So for example, I can just say, Oscar

80:52 nominated movies from 2002.

80:56 Google with interpret that query and of course

80:58 get me all my Oscar nominated movies.

81:06 And so, from here, of course, one click, I can watch it.

81:09 Now, search, of course, is backed by Google's knowledge

81:11 graph.

81:12 So I could also ask it a question.

81:13 So for example, I could say something like,

81:16 who played Katniss in the Hunger Games?

81:20 And of course, the answer is, Jennifer Lawrence

81:23 played Katniss Everdeen in the Hunger Games.

81:29 And again, I get movies and TV shows

81:31 she's involved, other related queries and YouTube clips.

81:35 So that's Google search tailored for your TV.

81:38 Let's now take a look at some of the applications.

81:41 So let me launch Google Play movies and TV first.

81:45 Now, developing for TV means creating a 10 foot user

81:48 experience, so-called because that's typically

81:50 how far you're standing from, or sitting from the screen.

81:53 In L, we've expanded the platform

81:56 to support a lean back experience with new framework

81:59 classes that help you to quickly and easily build

82:02 fluid cinematic, ten foot user experiences.

82:05 Our Play movies team was able to take their existing tablet

82:08 app from Android, quickly add the lean back classes on top

82:10 of it to produce a great TV experience.

82:13 They now have the same APK for TV, phones and tablets.

82:17 So what you see here is the browse fragment,

82:20 part of the lean back classes.

82:21 You got nice slick animations, you

82:23 got those bold material colors.

82:27 If I then dig into a TV show I can get more information.

82:31 This is showing our details view.

82:33 By the way, if you don't have your remote handy,

82:35 you can always use your Android Wear watch as a D-pad.

82:37 So for example, let's try this out.

82:40 So we've created a little wearable app.

82:43 So from here, I can actually interact with the TV.

82:46 So I can go back.

82:47 Let's go up and watch, Now You See Me,

82:49 I think that'll be a good show.

82:50 So I click that, and then we can start watching it.

83:00 So to wrap up, all of these lean back building blocks

83:03 are ready for you to reuse and customize

83:05 in your own applications as you see fit.

83:08 OK.

83:09 So next, let's talk about games.

83:11 People who have traditionally not thought of themselves as

83:14 gamers, frequently download and play games

83:16 on their phones and tablets.

83:17 And in fact, three out of four Android users

83:19 are playing games.

83:20 Which has helped make the Play store one of the biggest

83:23 catalogs of games in the world.

83:26 With Android TV, we enable you to take your games

83:28 to the biggest screen in your house.

83:30 And the games are getting really good.

83:32 So for example, let me fire up, one

83:34 of my favorites, which is Leo's Fortune, with this game pad.

83:39 And this is a really good, fun game.

83:40 It's kind of typical of a modern Android game.

83:42 It's got great game, it's got great graphics, fast and fluid.

83:46 I also like it because our lead UX designer's name is Leo.

83:49 He's not quite as cuddly as this guy,

83:51 but I can definitely see him in a handlebar moustache.

83:54 Anyway, so another advantage of Android TV

83:57 is you can tap into Google Play games

84:00 to share achievements and leader boards with friends.

84:03 You can even play multiplayer games,

84:05 which are friends playing from any device.

84:07 So for example, I can launch NBA Jam, which

84:11 is a really great game, and play a multiplayer game

84:13 with my friend, Alan here on the sofa.

84:15 So let's try it out.

84:16 So he's playing on his tablet.

84:18 I've got my game controller.

84:19 Let's try this.

84:20 So we have a bet on.

84:21 The first person to store is me.

84:24 OK, first one to two.

84:25 OK, let's go.

84:26 So the first person to do, has to buy the other person

84:28 beer tonight.

84:29 Let's go.

84:30 Oh.

84:32 Hopefully I can actually score.

84:33 I'm from Ireland, so I don't really understand this game.

84:36 Let's try this.

84:38 Oh.

84:40 OK.

84:40 One all.

84:42 Did you get two?

84:43 OK, last one, last one.

84:45 Bear with us.

84:46 I want free beer tonight.

84:52 Yeah.

84:54 All right.

84:55 It's a good thing there's a free bar at the after party, Alan.

84:58 OK.

84:59 I hope.

85:00 OK.

85:01 So that's games.

85:02 Now, sometimes you just want to cast or send

85:06 content from your movie, such as movies or music

85:09 from your phone.

85:10 So Android TV includes full Google cast support.

85:14 So you can use it just like a chrome cast.

85:20 In fact, Android TV enables us to bring

85:22 Google Cast to more TVs.

85:24 So for example, imagine Alan's visiting my house

85:26 and he wants to share his new favorite jam with me.

85:28 He could just fire Play music on his phone or tablet,

85:31 and cast it directly to my TV.

85:36 And hopefully his music will appear.

85:38 I I'm always really nervous about what

85:39 he's actually going to play.

85:40 I'm not sure I even what to see this.

85:42 OK, that's pretty innocuous.

85:43 That's cool.

85:44 All right, works great.

85:45 So that's Cast.

85:47 Now, to distribute your applications,

85:49 we've designed a very TV-centric Play store experience.

85:53 I'll just fire it up here.

85:58 The L developer preview comes with a sneak peek of TV apps

86:01 and games to showcase the platform.

86:02 And you'll recognize big names like Netflix and TED,

86:05 as well as some great casual and multiplayer games.

86:08 The store will open officially in the fall

86:10 with the launch of L, packed with some of the best content

86:13 available today for Android, tailored, of course, for TV.

86:16 So that's a quick overview of Android TV.

86:19 Android TV is ideal for multiple device types.

86:23 So everything from built-in televisions, to set-top boxes,

86:26 to streaming boxes, and gaming consoles.

86:29 We're working with silicon vendors across the industry,

86:31 including everyone from Marvell, to Intel and more.

86:35 Today, I'm super excited to announce that the entire 2015 86:38 HD and 4K Smart TV ranges from Sony, and the 2015 86:43 ranges of Sharp and TP Visions, Phillips

86:45 will run on Android TV.

86:54 We're also seeing activity in the pay TV space

86:57 with Bouygues, SFR, and LG uplus adopting Android TV.

87:00 And we'll also be seeing streaming boxes powered

87:02 by Razor, Asus others launching this fall.

87:06 And the Unreal engine demo that I showed you

87:08 earlier, that was running an Android TV,

87:10 with Nvidia's TK1 reference design,

87:12 capable of console style gaming.

87:14 And we expect to see TV products based

87:16 on that hardware in the fall, too.

87:19 Finally, to bootstrap the ecosystem today,

87:21 we're making a development kit we

87:23 call ADT-1, available through a sign-up page

87:26 to application developers like yourselves,

87:28 so you can start developing for TV today.

87:30 In fact, all the demos we saw were running on ADT-1.

87:34 So to learn more about Android TV,

87:35 you can visit developer.android.com/tv.

87:39 And I mentioned earlier, that Google Cast

87:41 is a core part of the Android TV experience.

87:43 And as Cast gets better, so does Android TV.

87:46 So to learn more about some of the exciting new developments

87:48 in Google Cast, and Chrome Cast, let me hand it over to Rishi.

87:51 Thank you.

87:56 RISHI CHANDRA: Thanks Dave.

87:58 So I want to give an update on Chromecast.

88:00 We launched Chromecast last July to deliver a new TV experience

88:05 that was both simple and powerful.

88:07 By using devices you already know and love,

88:09 your phone, your tablet, and your laptop.

88:12 And for the first time you had an experience that just worked.

88:16 All it took was the simple press of a button

88:18 from your favorite app.

88:20 Now we've been really happy about the positive reaction

88:22 we've gotten from both press and consumers.

88:25 We've sold millions of devices, and consistently

88:28 outsell all other streaming devices

88:30 combined in major retail channels like Best Buy.

88:38 And recently we've been able to replicate that

88:40 success in 18 countries.

88:42 Today, Chromecast is a top selling electronics device

88:46 on Amazon.

88:47 In the US, UK, France, Japan and Canada.

88:53 Thank you.

88:53 [APPLAUSE]

88:56 And as sales have ramped up, usage per device

88:58 has increased 40 percent.

89:01 Already, YouTube sees more active engagement on Chromecast

89:05 than any other TV streaming product.

89:08 The model is working.

89:10 Now, Chromecast is just the beginning.

89:12 We want to build an ecosystem of Google Cast ready apps,

89:15 and Google Cast ready devices.

89:17 So that's why we're excited that Google Cast support's coming

89:20 to Android TV devices as devices roll out later this year.

89:24 So let's talk a little bit about developers.

89:26 We launched Chomecast with five content apps.

89:28 And since then, we brought on board many of the top content

89:31 apps from around the world, including the BBC iPlayer,

89:35 and the WatchESPN app, which came just in time for the World

89:38 Cup to kill all productivity of the Chromecast team.

89:42 Luckily, we have a Brazilian VP.

89:45 Google Cast is designed to work with the most popular devices

89:47 you find in a home today.

89:49 In fact, in the last 30 days, almost 50 percent

89:52 of Chromecasts were used by devices for multiple platforms.

89:57 That's why in February, we launched the Google Cast SDK

90:00 across Android, iOS, and Chrome.

90:03 So now, any developer can take their existing mobile or web

90:06 app, and extend it right to the TV.

90:10 In just a few months, we have over 6,000 developers

90:12 registered, who are actively building over

90:14 10,000 Google Cast apps.

90:16 So we're starting to see a lot of momentum.

90:18 Now, as more and more apps are coming on board

90:20 and integrating with the SDK, we want

90:22 to make it even easier for consumers

90:24 to find your Google Cast ready app.

90:27 So today, we're announcing new discovery experiences

90:30 on Android, iOS, and Chrome.

90:32 Consumers can find these at chromecast.com/apps,

90:35 or from the Chrome Cast app on your phone, tablet, or laptop.

90:38 This is one of many improvements we're

90:39 making to Google Cast to make it even easier to use.

90:43 For example, one of my favorite features of Chromecast

90:46 is that it works with my friends and family,

90:49 because they can use their own devices.

90:51 Well today, we're announcing a new feature

90:53 to make that even easier by allowing others

90:55 to Cast your TV without needing to be

90:58 in the same Wi-Fi network.

91:04 So I've AK here on stage with me.

91:06 And let's say AK is over at my house,

91:08 and he wants to use his phone to share or Cast

91:11 one of his favorite YouTube videos to my TV.

91:13 Now normally, I need to share my Wi-Fi password with them.

91:16 But sometimes they're long and complicated,

91:18 or I don't rememeber it.

91:19 In this case, I just don't trust them with the password.

91:22 But I still wanted to see his great video.

91:25 Well with this new feature, AK can still take out his phone

91:28 and open up the YouTube app.

91:29 And you'll see in the top right, he's

91:31 only connected to the cellular network.

91:33 But you still see the Cast button.

91:35 Simply press the button, and it allow

91:38 him to connect to nearby devices.

91:40 Now in a few seconds, his phone will

91:42 connect to Chromecast through the cloud.

91:47 And that's it.

91:48 So now, we can control the video,

91:50 pause the video, play the video, just as

91:52 if he was on my same Wi-Fi network.

91:55 So how do we do it?

91:56 We're using a variety of different technologies, which

91:58 allows us to authenticate users in the same room

92:01 as a Chromecast.

92:02 And if for whatever reason, we can't automatically

92:04 detect or authenticate from you, we'll

92:06 ask for a pin that will always be present on the screen.

92:09 Oh, check this part out, this is my favorite part of the video.

92:16 It's pretty cool.

92:17 So now, you can invite all your friends over to your house,

92:20 kick back, and let them Cast to your TV

92:22 without any friction or hassle.

92:24 It makes Chromecast an even more social experience.

92:27 Now, this is an opt-in feature, so you always

92:29 have control over who can cast to your TV.

92:32 We'll be rolling this out to all Android users later this year.

92:36 And developers will get this for free by the Google Cast SDK.

92:41 So we also spent a lot of time thinking

92:42 about new use cases for the television.

92:45 For example, today lots of people talk

92:47 about the five hours per day people watch TV.

92:50 What about the 19 hours per day your TV's

92:53 just a blank, empty screen?

92:55 With Chromecast, we want to use this large, beautiful canvas.

92:59 So we start with something really simple.

93:01 A feed of scenic images that's been gradually expanding

93:04 over time.

93:05 Today, we're announcing the new Google Cast ambient experience.

93:09 And we call it Backdrop.

93:11 It just takes a minute to set up,

93:12 and you can do it for any iOS or Android device.

93:15 In this case, we're going to use an iPhone 5 for the demo.

93:18 And we have the feed accelerated just for the demo purposes,

93:21 so you can see more images.

93:24 So let's go in and open up the Chromecast app.

93:26 And you'll see Backdrop's a new option in the App drawer.

93:30 And from here, you can personalize the feed

93:32 to match your own interests and tastes.

93:35 One of the top feature requests we've gotten

93:37 is the ability to add your own personal photos

93:39 to the ambient feed.

93:41 Well now, you can.

93:42 So we turn on photos, you can select from one or multiple

93:46 Google+ photo albums.

93:49 And in a few seconds, you'll start seeing my personal photos

93:53 show up right on the TV screen.

94:02 It's that simple.

94:03 Your TV is now the largest picture frame in the house.

94:06 Grandparents everywhere are going to love this feature.

94:10 So we also have a lot more topics.

94:13 We want to give you an infinite source

94:14 of great and beautiful images.

94:16 One of my favorites is one called

94:18 Places, which brings geospatial images

94:21 from Google Maps to your TV.

94:24 These satellite photos give you a totally different perspective

94:26 on how you can see the world.

94:28 It's really amazing.

94:32 We also have other topics like news, and lifestyle,

94:35 and Google+ featured photos.

94:37 One of my other favorite topics is

94:38 art, which includes artwork from famous museums and collections

94:41 from around the world, including the Getty Museum,

94:44 and the National Museum of Women in the Arts.

94:47 And now, my TV's a beautiful set of paintings.

94:50 Every topic is curated to make sure we're

94:53 showing high quality and safe images.

94:57 And every user has the ability to control

94:59 which topics show up on the TV.

95:01 Now, generally I'm going to leave

95:03 this in the background of my house.

95:04 But let's say one of the images catches my eye,

95:07 and I want to learn a little bit more info about it.

95:10 I can use Google Voice Search to always learn more.

95:15 MALE VOICE: What's on my Chromecast?

95:21 RISHI CHANDRA: For every topic, we'll

95:23 show a synchronized card that will

95:30 show you relevant information and relevant actions.

95:33 So in this case, I can learn more

95:35 about any artist of the painting.

95:38 Backdrop brings your TV to life even when

95:40 you're not actively using it.

95:42 And we're looking forward to working with third party

95:45 developers to actually bring in their own topics into the feed.

95:49 Backdrop will roll out to all Chromecast users

95:51 later this summer.

95:53 So finally, one of the big advantages of the Google Cast

95:56 model is that we can start thinking beyond traditional use

95:59 cases of the TV like video.

96:02 For example, your phone and your tablet

96:03 have unlimited possibilities.

96:05 And there's many times we want to bring those experiences

96:07 and extend them to the TV.

96:10 Well to help accelerate that shift,

96:11 we're launching a new Google Cast

96:13 feature that allows you to mirror any Android

96:15 device to your television.

96:22 So to start mirroring, just go to your Chromecast app

96:24 on your Android device and select Cast screen.

96:28 And from here, everything on your phone

96:30 will just show up on the TV.

96:32 It's that simple.

96:34 No cables or wires needed.

96:37 Now we built our own protocol to reduce latency and framedrops,

96:40 so the experience feels really natural and smooth.

96:43 And now you can share anything on the big screen.

96:46 So let me give one example, a real life

96:48 example I had a few months ago using Google Earth.

96:53 I was planning a family trip to Maui later in the year,

96:55 and I want to show my four-year-old daughter

96:58 where Maui is on the map.

97:00 So instead of huddling around my small phone,

97:02 I ended up opening Google Earth and projecting right to the TV.

97:05 So let's type in Molokini, one of my favorite snorkleing

97:07 destinations in Maui.

97:10 And as you can see, it's a totally different experience

97:13 to navigate the world with my daughter

97:14 on the biggest screen in the house.

97:17 You can play with this for hours.

97:20 So we're going to do one more fun thing.

97:22 We're actually going to open up the camera app.

97:24 And we're actually going to mirror in live action --

97:26 a little nervous -- in live action all of you on the big

97:29 screen.

97:38 It's a lot of fun.

97:40 So we're working with a large variety of devices,

97:43 from Samsung, from Nexus HTC, and LG,

97:48 with many more devices coming soon.

97:51 We'll be rolling out this initially in beta

97:53 as devices get updated to the latest version of Google Play

97:55 services, which will happen over the next few weeks.

97:59 As you can see, we're really excited to show

98:02 how the Cast model can change how

98:04 we think about entertainment in the home.

98:06 And we look forward to innovating with all of you

98:08 to make that a reality.

98:10 Now I'll pass it back to Sundar.

98:20 SUNDAR PICHAI: Thanks, Rishi.

98:21 So we've talked so far about wearables, your car,

98:25 and the television in your living room.

98:28 Another important device in our lives is our laptop.

98:32 Our journey here began with Chromebooks.

98:36 We are seeing tremendous momentum here.

98:37 We started the journey with one reference device, the Cr-48,

98:43 which we launched about three years ago.

98:46 A year later, but with Samsung and Asus,

98:49 we launched two devices in two countries.

98:53 Fast forward to today, we have eight OEMs making 15 devices,

98:58 with many more on the way in 28 countries.

99:06 Users really love the fundamental insight

99:09 behind Chromebooks.

99:10 Speed, simplicity, and security.

99:14 All 10 of the top 10 highest rated laptops today in Amazon

99:19 are all Chromebooks.

99:25 We are seeing tremendous traction in education, as well.

99:28 Just this year alone, the number of Chromebooks sold to K

99:32 through 12 schools in the United States has grown by 6x.

99:36 And we are investing a lot more in this area.

99:40 So let me talk about how we're evolving the Chromebook

99:42 experience.

99:43 As I said earlier, users almost always

99:46 have a smartphone with them, including

99:48 when they're using a Chromebook.

99:50 So we want to increasingly connect these experiences

99:52 together, so that they have a seamless experience

99:55 across their devices.

99:57 Let's take a look at what they can do.

99:59 Dave, Kan is going to help me through with some demos.

100:02 Dave talked already about how with the L release,

100:05 you can unlock your phone knowing

100:07 that it is with you, based on what

100:10 we are doing with APIs now.

100:12 Well if we can unlock your phone,

100:14 we can also unlock your Chromebook.

100:16 Every time you approach your Chromebook,

100:18 and your phone is with you, we will automatically

100:21 unlock your Chromebook, and sign you

100:23 into your favorite applications and services.

100:25 So it works seamlessly.

100:31 We've already added Google Now notifications,

100:34 so the same Google Now cards, which you see on your phone,

100:37 you see them on your Chromebook.

100:39 And we are adding a few more things.

100:41 Let's say you get an incoming phone call.

100:43 You will start seeing those incoming call

100:45 notifications on you Chromebook.

100:48 If you get a text message, you would see those text messages

100:52 on your Chromebook, as well.

100:54 And I recently had this experience,

100:56 my phone was in my pocket and running out of battery.

100:59 And my Chromebook popped up a notification,

101:02 and said your phone is running out of your battery.

101:04 Simple, delightful experiences to connect

101:07 your phone and your Chromebook.

101:10 As we started working on this, one

101:13 of the things that struck us is, wouldn't it

101:15 be nice if you could get some off your favorite Android

101:19 applications, which you love on your phone, on your Chromebook.

101:24 So this is a difficult challenge technically,

101:27 so we've been working on this project for a while.

101:30 Our goal is to bring your favorite Android applications

101:33 in a thoughtful manner to Chromebooks.

101:36 We want this to be intuitive for users.

101:38 These applications were built for Android for the phone,

101:42 so we want them to work when there is a mouse, keyboard

101:44 and touch events, et cetera.

101:46 For developers, we want this to work

101:49 with as little modifications as possible.

101:53 So we are in early days, and we are

101:54 going to show you a preview today.

101:56 And Kan is going to help me with it.

101:58 So Kan is going to pull his tablet up.

102:01 And what you're seeing on his tablet is Evernote.

102:04 This is one of his favorite applications.

102:07 And I think he is planning a birthday party there.

102:10 Let's switch over to the Chromebook.

102:12 And the same Android application is now

102:15 available in the launcher on your Chromebook.

102:19 So you can click that, and you get the exact same application.

102:23 And because you're on a Chromebook,

102:25 you can start making changes to it.

102:27 You can go to the web, copy-paste,

102:30 everything just works.

102:32 We've ported that Android application

102:34 to run within your Chromebook.

102:37 Let's give you one more example.

102:40 We'll pull a canonical application, an application

102:43 you see on your phone, like Vine.

102:46 We now have that application running on your Chromebook

102:49 Pixel, as well.

102:51 Kan is going to browse through the World Cup channel.

102:54 And you can see how they experience

102:55 feels native and intuitive on a Chromebook.

102:59 And because the app has access to some of the underlying

103:02 device APIs, it has access to the camera API,

103:06 Kan can actually take a clip of himself, just like a Vine user,

103:09 and post it straight from his Chromebook.

103:14 The final application we want to show to you is Flipboard.

103:17 It's a beautiful, immersive experience.

103:20 And the Android version of the app

103:21 now comes alive on Chromebooks.

103:23 And you can see how beautiful and immersive this experience

103:26 is.

103:27 We are very, very excited about bringing

103:30 important, favorite Android applications for uses straight

103:34 on their Chromebooks, so that they

103:35 can get an even more connected experience.

103:38 And we are working on bringing our experiences

103:41 across both Android and Chrome together,

103:43 so that it looks in a delightful way for our users.

103:53 So far we've talked about bringing our platforms, Android

103:57 and Chrome, to all the connected devices in your life,

104:00 so that we can create a great experience across all of them.

104:04 But there's another important environment,

104:06 we want to talk to you about it as well.

104:08 Most of you spend a lot of time in your workplace.

104:12 We've always had this funny insight inside at Google,

104:15 that it is the same person at work,

104:18 and it's the same person at home.

104:20 That's a picture of Matt, which is his work badge.

104:23 In his spare time, he's an Lonely Planet traveller,

104:26 and he writes books for them.

104:28 So you can see, people have very, very different contexts.

104:31 Yet your computing experience is very fragmented.

104:35 The way it worked in the PC world

104:37 is companies gave you a separate laptop for work

104:41 and you had your own personal laptop.

104:44 The experience was disconnected.

104:47 And that model starts breaking down

104:49 when you start thinking about phones.

104:51 No one wants to carry two phones around.

104:54 So what we are doing is, with the L release and Android,

104:59 we are adding a whole set of APIs to unify this experience.

105:03 So we are bringing both your experiences, so that as a user

105:08 you can have one experience, and both your personal applications

105:12 and corporate applications can live on the same device.

105:20 We are doing it thoughtfully by providing underlying data

105:23 separation.

105:25 So all your personal data is isolated

105:27 from your corporate stuff, and vice versa.

105:30 So we're providing full data isolation and security,

105:33 which enterprises care about.

105:35 As developers, there is no modification

105:38 needed of your existing apps.

105:40 All your apps will be available through Google Play,

105:43 and companies can buy them in bulk and deploy it,

105:46 so you can reach many more users.

105:49 These are all available in L, but we are wrapping up many

105:52 of these features as a separate apps

105:54 so that it will also work on prior versions of Android.

105:59 And finally, Samsung has done a lot of important work

106:02 in this area with Knox.

106:05 And we really want to thank Samsung,

106:07 they are contributing all of their work in Knox

106:09 to the Android platform, so that we have one consistent story

106:13 for enterprises across Android.

106:24 So we are also working with major partners, all major OEMs,

106:29 names you would recognize, in the fall

106:32 to have a certified Android for Work program,

106:35 by which we can bring these devices to companies

106:38 with guaranteed updates and full security.

106:40 So we are very excited by this journey.

106:43 As we bring Android for Work, one of the important use cases

106:47 we care about is productivity.

106:50 Documents collaboration.

106:52 Which is why we've invested a lot in Google Docs

106:55 and the whole suite of editors.

106:57 We've always had great mobile apps

106:59 for Google Docs and Sheets.

107:01 And today, we are also announcing Google Slides,

107:04 so that you can create and share presentations

107:07 straight from your mobile devices.

107:09 One of the common use cases we run into in companies,

107:13 when people use this, is they run into Office files.

107:16 It's a very common experience for all of us.

107:18 And we want to make sure as we bring Android for Work, Office

107:22 files work seamlessly.

107:24 So we acquired Quickoffice, and we've

107:27 been hard at work integrating Quickoffice into Google Docs.

107:31 And today we are announcing native office editing

107:34 built within the Google Docs suite of editors.

107:42 Let's take a look.

107:44 Kan is going to show how this works.

107:46 I'm sure you're all familiar with getting emails

107:49 in which you get a Word file.

107:51 And so if you get a Word file in your email,

107:54 you can click on it.

107:55 In the past, we would convert it into a Docs file,

107:59 but we don't anymore.

108:01 And so what you see is a native Word file,

108:03 handled straight within Google Docs.

108:05 And this looks for sheets and presentations as well.

108:08 And Kan can make edits to the document.

108:11 And most importantly, when he saves it,

108:13 it saves back as a Word file, so that he can send it back

108:16 to people.

108:17 So it works seamlessly.

108:20 You can always convert this to Google Docs,

108:24 so that you get advantage of world class collaboration

108:26 features.

108:30 One of the common features we get requests on is redlining.

108:34 So we have done great work to bring modern collaborative

108:37 approach to redlining.

108:38 And the feature is called suggested edits.

108:41 So just like Google Docs always does,

108:44 people can add their comments and very easily you

108:49 can review and accept changes.

108:51 So with suggested edits, we have modern, collaborative features.

108:55 And with built-in native Office, we

108:58 think our productivity suite is great for the workplace.

109:03 All our productivity files live in Google Drive.

109:06 We launched Google Drive about two years ago.

109:10 And today, we are very excited to announce

109:12 Google Drive has over 190 million 30-day active users.

109:21 These are not registered users, these are 30-day active users.

109:25 And the number has grown over 85 percent just last year alone.

109:29 We are now bringing all of Google Drive

109:31 for Work functionality to companies as well.

109:36 And what we are doing is we are encrypting the data,

109:39 both during transit and at rest on our servers.

109:44 We are providing enterprises full APIs.

109:48 Audit, and analytics APIs, based on how their employees are

109:52 using their data across the company.

109:55 And finally, it is hassle free.

109:58 Unlimited storage for just $10 per user per month.

110:09 So the combination of Android for Work,

110:12 our Google Docs suite, and Google Drive for work,

110:15 really offers a comprehensive suite for companies,

110:19 and joins Google Apps and Chromebooks.

110:21 And as companies are thinking about moving away

110:23 from traditional Windows architecture,

110:26 we are seeing tremendous momentum.

110:29 67 off the top 100 startups gone Google.

110:32 58% of Fortune 500 companies have gone Google.

110:37 And 72 of the top 100 universities have gone Google.

110:48 So we've talked about how we are bringing our platforms, Android

110:52 and Chrome, across all your devices.

110:55 Not just for your personal life, but also for your workplace.

110:59 We're going to switch gears now, and talk

111:01 about how you all as developers can build success

111:04 on top of our platforms.

111:06 In fact we hear amazing stories every day.

111:10 From corporate startups to students who act as developers

111:15 and create amazing experiences on top of our platforms.

111:19 We've put together a video so that you can take a look.

111:23 [VIDEO PLAYBACK]

111:34 -Jackthreads is a ecommerce destination for men's fashion.

111:38 I think everyone here is unique in so many ways.

111:40 We have such a crazy hodgepodge of people here.

111:44 -We understand so much about our guys needs.

111:47 The demand that they have for truly

111:49 personalized communication.

111:51 Almost 70% of the interactions that we have our audience

111:54 are mobile.

111:55 More than 50% of our transactions

111:56 are driven through mobile.

111:58 We've leaned in really hard to build best in class

112:01 mobile experiences, where every day

112:03 you don't know what you're going to find.

112:05 We want to feel like the smallest

112:08 big company in the world.

112:16 -There's 1.2 billion people in the world

112:18 learning a foreign language.

112:19 The majority of these people are learning to get a job,

112:22 and they are low socioeconomic conditions.

112:24 My views on education have always

112:26 been influenced by where I come from, which is Guatemala.

112:29 So Guatemala is a very poor country.

112:31 I wanted to come up with a way to teach

112:33 languages that was entirely free.

112:35 Today, Duolingo was the most popular way

112:37 to learn languages in the world.

112:38 We have 30 million students.

112:40 There are more people learning a language on Duolingo

112:43 than in the entire US public school system.

112:46 85% of the people use it through an app.

112:49 Over the next 20 years, education

112:50 is going to fundamentally shift.

112:52 Smartphones are going to allow us bring education

112:55 to the people who don't have access to it.

113:03 -We had seen Andres a couple times during our PE period,

113:07 studying the track.

113:08 And we didn't realize it took so much work

113:11 to actually get to know the school.

113:13 -They have to live through darkness every day.

113:16 No one can really feel it, they take seeing for granted.

113:18 -We were like why not create something

113:20 that will actually make a difference.

113:22 -Hello Navi will use GPS and a location sensor,

113:26 so that way you have a specific point for each of his classes.

113:29 -Where do you want to go?

113:31 -The coding, it took weeks just to get it down.

113:36 -If you mess up one little tiny thing

113:38 it can mess up the whole app.

113:41 -We made a difference today, not just to him,

113:43 but to many others that will eventually use this app.

113:46 -They care about me.

113:48 That's why they made this app happen.

113:51 I never got to hear the word "inspiration"

113:55 in my whole entire life.

113:58 It made me proud.

114:02 [MUSIC PLAYING]

114:07 [END VIDEO PLAYBACK]

114:09 [APPLAUSE]

114:12 SUNDAR PICHAI: I was incredibly moved

114:14 when I saw that video the first time.

114:16 And even more excited, all the folks

114:18 in the video, including those middle school

114:19 students from Resaca School in Texas

114:22 are joining us in the audience today.

114:24 [APPLAUSE]

114:51 Thank you.

114:53 We know these examples are just the tip of the iceberg.

114:56 And we care deeply about evolving our platform

114:59 so that you can continue to create

115:00 these amazing experiences.

115:02 So we're going to talk about that next.

115:04 The first is how you can build and scale your applications

115:08 on top of Google Cloud Platform.

115:11 We've been within Google building world class

115:14 infrastructure, and running large scale services,

115:17 like Search, Maps, YouTube, and Gmail.

115:21 And we are very excited we are bringing

115:23 the full power of the Google Cloud Platform

115:25 to developers like you.

115:26 To talk about that, I'm going to invite Urs Holzle.

115:34 URS HLZLE: Thank you.

115:35 Thank you, Sundar.

115:37 Hi everyone.

115:37 I'm Urs Holzle.

115:39 And my team and I built the Google Cloud Platform.

115:42 And every day, we go to work excited to see what you all

115:48 are doing with it.

115:49 And literally every day, there's hundreds of thousands

115:51 of developers building applications

115:53 that scale to hundreds of millions of users.

115:57 And they keep their teams small.

115:59 And they can focus on what they do best.

116:02 Because we run the rest of the infrastructure for them.

116:05 Let's have a quick look on what the Google Cloud

116:09 Platform is about.

116:11 First of all, of course we have VMs with Compute Engine.

116:15 And they are best in class performance and price.

116:19 And you can run whatever code you want.

116:21 But if you don't want to bother administering machines,

116:24 we also have App Engine.

116:26 And App Engine makes it incredibly easy

116:28 to write really high scale applications.

116:31 That's how Snapchat got to incredible scale

116:34 without having a single back-end developer.

116:38 On storage, we offer many options,

116:41 including, of course, SQL as a fully managed service,

116:45 NoSQL, which we invented, by the way.

116:48 Our NoSQL services running billions of queries every hour.

116:52 And then, of course, object storage

116:53 that scales to exabytes.

116:55 But you cannot just store data.

116:58 You also want to analyze it.

117:00 And in our platform, you have many tools

117:02 that make it really easy for you to analyze data

117:04 sets without worrying about scalability.

117:06 For example, with BigQuery, you could

117:08 stream hundreds of thousands of records per second

117:11 into the cloud, and inquiry then interactively with SQL.

117:17 Beyond technology, we also lead the industry

117:19 in price and performance.

117:22 And as hardware gets cheaper, we pass on these things to you,

117:26 so you see Moore's Law in the cloud.

117:29 And moreover, you get great sustained usage discount

117:34 without having to sign up for contracts,

117:37 without having to make upfront payments,

117:39 or without having to forecast your utilization

117:42 for the next three years, just to get right pricing.

117:45 But of course what really matters to

117:47 us is seeing what you developers do with our platform.

117:52 And whether it's Netflix for storage, or Wix web filings,

117:57 Khan Academy who run their entire business on our cloud,

118:00 there's a lot going on.

118:02 And I'm going to tell you just two things

118:04 about two recent new customers.

118:07 First, Secret.

118:09 Secret, with a single back-end developer,

118:12 built an application that in two months

118:15 saw an over 1000-fold increase in traffic.

118:20 And they came to Google because they needed a platform that

118:23 can handle this kind of hyper-scale growth

118:27 without much hassle.

118:29 And that's exactly what they got.

118:31 Or maybe you've seen the debut of "Rising Star" on ABC

118:35 last Sunday.

118:36 It's an interactive music competition

118:38 where millions of TV viewers vote

118:41 in real time on the winner.

118:43 Screenz, the company behind "Rising Star"

118:45 is using Compute Engine and BigQuery

118:48 for the instant voting app.

118:50 And it's been battle tested to run

118:52 at 1.3 million queries per second.

118:55 But that's why developer productivity is actually

118:58 very important to us.

119:00 We try to make our cloud not just

119:02 highly functional, but also really easy to use.

119:06 And as you've seen, the best mobile apps

119:09 come with an intelligent back end that's in the cloud.

119:14 And there's no better place to build that back end then

119:17 on Google.

119:18 Because we have the performance and we have the tools

119:21 that make it really easy for you to build those applications

119:24 with small teams and little focus on operations.

119:28 And today I'm very excited to show you four new tools.

119:31 Very, very cool new tools that make it really easy

119:34 to understand your server side applications.

119:37 So please welcome, Greg DeMichelle,

119:38 who's going to show you some demos.

119:41 GREG DEMICHELLE: Thanks, Urs.

119:47 As part of showing you some of the new features

119:49 that we're showing you for the cloud for the cloud platform,

119:51 I've built a sample application here.

119:54 It allows me to record walks that I'm taking.

120:00 So this application allows me to record

120:03 a walk I took through the city, share it with my friends,

120:06 let them experience the same walk I took,

120:08 and then share comments.

120:09 Now, since this whole purpose of this application

120:12 is to share information, obviously I

120:14 need to store that data somewhere other than my device.

120:17 And how do I do that?

120:18 The answer is Cloud Save.

120:20 Cloud Save is a new, simple API, that

120:23 lets me save and retrieve per user information.

120:26 Now that could be application data,

120:28 it could be user preferences or setting.

120:30 And I do this with no server side coding.

120:33 I just do a few lines of client side.

120:35 And with that my data can be stored in the cloud.

120:38 It can be retrieved and synchronized to other devices.

120:41 It can be available offline, so if my user

120:43 doesn't have an internet connection

120:44 they can still walk through this walk.

120:47 And I'm a cloud guy, so what really gets me excited

120:50 is that this data is stored in Cloud Datastore.

120:53 Which means I have the full access to the cloud platform.

120:56 I can query that data with BigQuery.

120:58 I could build web applications that

121:00 use that data using App Engine or Compute Engine.

121:03 And that's in fact what I've done in this case.

121:05 So let me show you the web app version of Walk Share,

121:07 accessing the same walk data.

121:10 So this is the web version.

121:11 I took a nice walk out by the Golden Gate Bridge

121:14 yesterday and recorded it.

121:16 I can expand the window and I can see the comments.

121:19 Now, if you look at the comments,

121:20 right away you can see that there's something a little

121:22 funky going on.

121:23 I have code here to replace common character sequences

121:27 with emoticons.

121:28 but if you look at that, they're sort of running amok.

121:30 I'm putting emoticons where they don't belong.

121:32 So I've got some sort of bug that I need to find.

121:35 So I'm going to flip over here and look at the source code

121:37 from GitHub for this application.

121:40 Now, this application's running in production.

121:42 It's not running on one server, it's

121:44 running on tens or hundreds of servers.

121:46 And there's no way to debug an application that's

121:48 running in that kind of environment,

121:50 at least not until today.

121:52 So I'm going to click into the debug mode.

121:54 I'm going to click down here, and I'm

121:56 going to put a watch point on this line of code.

121:58 Now the platform is watching all those servers until one of them

122:03 actually hits that line of code.

122:05 So at this point there's people hitting the traffic,

122:07 it'll take a few seconds.

122:10 Take a few seconds.

122:13 Nope.

122:14 Not like, oh there it went, I just had to wait long enough.

122:19 Patience pays off.

122:21 You'll notice, however, I didn't hit the right comment

122:24 because this doesn't show the bug.

122:25 So I'm actually going to us a conditional watch point and say

122:27 comment, dot commentator, name is Rachel.

122:36 And now I'm going to wait a few seconds,

122:38 and will actually hit the break point for that comment.

122:42 Call stack, local window, and sure enough,

122:44 this is the one that's having the problem.

122:47 So, to fix it, I'm going to go up

122:49 and I see here's the code that was being called.

122:51 I can switch into edit mode and very quickly change

122:54 this regular expression to be the correct one

122:57 and learn that I should always have Urs do my code

122:59 reviews because he never makes regular expression errors.

123:02 So that's cloud debugging.

123:05 But when I was looking at that application,

123:07 I also noticed that the application

123:09 seemed a little slow to me.

123:11 It seemed like it wasn't really responding right.

123:13 How do I find out what's happening in production there?

123:16 Another new feature of the platform is cloud tracing.

123:20 Cloud tracing gives me a tracing view

123:22 of all the various requests my application was processing

123:25 and how long they took.

123:27 I'm going to drill in for comments,

123:30 and sure enough, when I look at this,

123:32 I've got some queries here that are taking 200 milliseconds.

123:35 That really seems long.

123:37 I'm going to drill into one of them,

123:38 and I get a view of all the service

123:40 calls that went into that request.

123:45 So what it appears to be happening here

123:47 is that I'm doing a bunch of data store

123:49 operations in sequence instead of doing them in parallel.

123:52 And that's not really the best practice for data store.

123:55 So to fix that I'll switch over to the code for that.

123:59 I'll edit it.

124:00 Sure enough, this whole block of code is in a four loop.

124:03 That's not really the best practice

124:05 for getting the best performance out of data store.

124:07 So we will delete all that.

124:09 And I'll paste in the proper version of the code, which

124:13 actually then does all of that as one operation.

124:15 I can commit to change.

124:16 It gets rebuilt.

124:17 I'm in production.

124:18 I fix my performance problem.

124:20 Now, I fix it for one user, how do

124:23 I know I fixed it for everybody?

124:25 Well it turns out, cloud tracing also gives you

124:28 the ability to have reports.

124:30 So this is a report that I've done

124:32 that compares the latency before and after that change.

124:36 The blue part is before I made the change,

124:38 the orange part is after I made the change.

124:40 So sure enough, I can see that my curve shifted to the left,

124:43 my application is in fact faster, not just for one user,

124:46 but for every user.

124:49 So the last thing I want to show you cloud monitoring.

124:52 Last month the team from Stackdriver joined Google.

124:55 And I'm really happy to show you some

124:56 of the integration we've been working on.

124:58 One of the hard parts about operating a service

125:00 and production is building up the monitoring

125:02 and alerting that you need in order to stay on top of things.

125:06 With cloud monitoring you of course

125:08 get the basic infrastructure type monitoring you'd expect.

125:12 Disks, VMs, that sort of thing.

125:14 But what's really powerful is you also

125:16 get service level monitoring.

125:18 We automatically detect what services you're using

125:21 and give you default dashboards and monitoring.

125:24 And it's just for Google services.

125:26 We automatically detect over a dozen open source packages,

125:29 such as Redis in this case, and automatically

125:32 give you intelligent default monitoring for those.

125:35 So with no additional work, I get a dashboard

125:38 that helps me stay on top of what's

125:40 happening in my app in production.

125:43 Finally, as everybody who runs a service knows,

125:46 the last thing you want is your customers

125:48 to be the first ones to find out that you've got a problem.

125:50 You want to have alerting in the event of problems.

125:54 Cloud monitoring includes alerting.

125:56 So I can go and set custom alerts

125:58 on any of a variety of metrics.

126:00 Whether it's on App Engine or Compute Engine or Redis.

126:03 In this case I have an alert set up

126:05 to tell me if Redis exceeds its memory threshold for more

126:09 than five minutes, and I have a choice

126:11 of how I want to be notified.

126:13 Do I want to be emailed, or paged, or sent a text message.

126:17 So that was just a very fast preview of four new developer

126:19 productivity features coming to the cloud platform.

126:22 And with that, I'll turn it back over to you, Urs.

126:24 URS HLZLE: Thank you, Greg.

126:30 So you just saw four new features

126:31 that make it much easier to build and understand

126:34 your back end.

126:35 Cloud Save securely saves and synchronizes across devices.

126:39 No service side code, just a few lines of client code.

126:43 Cloud Debugger gets your desktop debugging in your server app.

126:47 Debug, a live production apps with live traffic,

126:50 get local stack traces, and so on, and so on.

126:53 How cool is that?

126:54 Cloud Trace then shows you your latency statistics

126:58 across different groups.

126:59 You can compare before and after.

127:01 And Cloud Monitoring gets you intelligent

127:03 monitoring with almost no set up,

127:06 including for many popular open source packages.

127:10 But now let's go from code to data.

127:14 Information is being generated at an incredible rate.

127:17 And of course, we want you to be able to analyze

127:20 that information without worrying about scalability.

127:25 And today, even when you're using MapReduce,

127:28 which we invented over a decade ago,

127:30 it's still cumbersome to write and maintain

127:33 analytics pipelines.

127:35 And if you want streaming analytics you're out of luck.

127:39 And in most systems, once you have more than a few petabytes,

127:42 they kind of break down.

127:45 So we've done analytics at scale for awhile,

127:47 and we've learned a few things.

127:49 For one, we don't really use MapReduce anymore.

127:53 It's great for simple jobs, but it gets too cumbersome

127:57 as you build pipelines and really, everything

127:59 is an analytics pipeline these days.

128:02 So what we needed was a new analytic system that scales

128:06 to exabytes, that makes it really easy to write pipelines,

128:10 that optimizes these pipelines for you.

128:13 And that let's you use the same code for both batch

128:16 and streaming analytics.

128:19 And today we're announcing just that with Cloud Dataflow.

128:22 Cloud Dataflow is the result of over a decade of experience

128:27 in analytics to simple fully managed service.

128:30 So no machines to worry about.

128:32 You can create data pipelines for ingesting, transforming,

128:36 and analyzing arbitrarily large data sets,

128:41 both in batch, and in real time mode.

128:44 And to see data flow in action, I've

128:47 asked no other than our very own, Eric Schmidt,

128:50 to help me look at something that's happening right now,

128:53 namely the World Cup.

128:54 So please welcome Eric Schmidt.

129:00 ERIC SCHMIDT: Thanks, Urs.

129:02 This demo is about performing sentiment analysis of World Cup

129:05 matches with Cloud Dataflow.

129:08 We're going to analyze millions and millions of tweets

129:11 per match, and calculate negative or positive sentiment

129:15 per team, and correlate the sentiment to match data.

129:19 I'd like to thank the developer relations team at Twitter

129:23 for the support in using the Twitter data

129:25 APIs for this demo.

129:27 Cloud Dataflow is an SDK and a managed service

129:31 for building big and fast parallellized data analysis

129:36 pipelines.

129:37 You write a program as a logical set of data

129:41 transformations to specify your analysis.

129:43 You then submit the pipeline to the data flow service.

129:47 And it handles all the optimization, deployment

129:49 of VM's, scheduling and monitoring for you.

129:54 Now here's the code for my sentiment pipeline.

129:57 The data flow API provides a simple mechanism for you

130:00 to add one to many transforms to your data.

130:03 The first transform extracts a real time stream of JSON data

130:08 from Cloud Pub/Sub.

130:10 Now, this pipeline is running in streaming mode.

130:13 However, Dataflow can also be run in batch mode.

130:16 Meaning I could point this exact same pipeline at Archive Data,

130:22 say in BigQuery, and produce the exact same analysis.

130:25 One pipeline, batch or stream.

130:28 Now let's drill into the second transform, tweet transformer.

130:34 Tweet transformer is responsible for the core transformation

130:37 and mapping of my data.

130:39 I deserialized the stream of JSON into a tweet object.

130:43 I translate it if it's needed, using Google Translate API,

130:47 and I score the sentiment with a third party

130:50 service from AlchemyAPI.

130:52 Now the part of syntax that you see

130:54 here is what parallelizes the processing for each step.

130:57 This parallelization is optimized for you

131:00 by the data flow service across processes of machines.

131:04 Now finally, I apply another transform

131:07 to calculate the average for all the tweets in a three minute

131:11 sliding window.

131:13 Dataflow provides powerful built-in primitives

131:16 for doing MapReduce-like and continuous computation

131:20 operations.

131:21 Two lines of code, two lines of code

131:24 to create a sliding window, and to average all the tweets

131:26 within that window, reducing a mass of a collection

131:29 of data down to one record, per minute, per team.

131:33 Dataflow handles all the aging out of my data,

131:36 shuffling, et cetera.

131:37 I don't have to worry about that.

131:39 So awesome, we have a pipeline.

131:41 Let's switch gears and take a look

131:42 at what this would look like in production.

131:47 What you see here is my deployed pipeline

131:52 shown in the data flow monitoring UI built right

131:55 into the cloud developer's console.

131:58 I'm going to go ahead and click in,

132:00 and you'll notice that the graph correlates

132:03 one to one to the code that I just showed you.

132:06 Making it easy for you to understand your processing

132:11 topology.

132:12 If I scroll down further, I can see other information.

132:16 For example, the total records of processed.

132:19 So I started this pipeline this morning,

132:21 right before I went on stage.

132:22 We processed around 5 million, 5.2 million tweets.

132:27 And right now I'm running at about 406 records a second.

132:30 We have lots more head room with this pipeline,

132:33 but I wanted to show you that my data is actually flowing.

132:37 Now our goal is to make data flow monitoring

132:40 valuable and integrated with the rest of your cloud development

132:43 experience.

132:47 Now, let's take a look at what we could do with this data.

132:52 This is a replay of the opening match

132:54 between Brazil and Croatia.

132:58 This represents an analysis of millions and millions of tweets

133:02 and tens of thousands of touch information

133:06 represented in the match.

133:08 Now if I scroll back and forth, I

133:10 can see something interesting happened at the 71st minute.

133:16 Brazil scores a goal, but you'll notice,

133:19 in orange, Brazil's sentiment goes down.

133:23 So this is odd.

133:24 Typically the team that scores a goal

133:26 will have positive sentiment.

133:29 Now if I look in the timeline, there's

133:31 also some information that's been

133:32 injected for me by my pipeline.

133:34 That says controversial goal, controversial call

133:39 related to the goal.

133:41 So this is giving me some insight

133:42 as to why there may be some negative sentiment

133:44 towards Brazil, but I still don't trust my algorithm.

133:48 So, fortunately, I've had Dataflow stream

133:52 all of my raw data into BigQuery so that it can easily

133:56 perform interactive analysis over very, very large data

133:59 sets.

134:00 Now, here are some of the filter raw data

134:03 around that 71st, 72nd minute.

134:06 So there you have it.

134:07 The fans are upset with Brazil related to a bad call

134:12 by the referee.

134:13 Now, I think I understand my correlation

134:16 a little bit better.

134:17 I absolutely love the World Cup.

134:19 So thanks Dataflow.

134:20 With cloud Dataflow you have a fully managed service

134:23 and unified programming model for classic ETL

134:26 and continuous analysis over simple or highly complex

134:30 pipelines in batch or streaming mode.

134:33 Back to you, Urs.

134:34 URS HLZLE: Thank you, Eric.

134:36 And I'm sure as all of you know Switzerland is playing,

134:40 my home country Switzerland is playing at 1:00 PM today,

134:43 and I hope at the end of the game

134:44 my sentiment is going to be at 100.

134:47 But, to go back to the technical part,

134:50 I hope you understand now why we stopped

134:53 using MapReduce years ago.

134:56 Cloud Dataflow really does for entire pipelines

134:59 what MapReduce did for a single step.

135:03 Namely it just makes it very easy.

135:05 You don't have to worry about scalability,

135:06 you don't have to worry about parallelism.

135:09 And it will run faster and scale better than pretty much

135:14 any other system out there because we needed it to,

135:17 to solve our own problems.

135:20 So whether it's data or code on a server or on a mobile device,

135:25 we tried to make your life easier as a developer.

135:28 More productive, while giving you

135:30 the best price and the best performance of any cloud.

135:35 We've released hundreds of new features in just last year,

135:39 and we're seeing incredible growth, thanks

135:41 to all of you who are using the platform.

135:44 I'm very excited to see what you can

135:46 do next year with the power of Google behind.

135:49 Thank you.

135:55 And now I would like to introduce

135:57 Ellie to talk about Google Play.

135:59 Ellie.

136:05 ELLIE POWERS: Hi everybody, I'm Ellie.

136:07 And I'm absolutely thrilled to be talking to you

136:09 about a few things that we're doing

136:11 to help you all create amazing user experiences

136:14 and also grow your businesses.

136:16 Now Google Play is the key to getting your apps

136:19 into the hands of millions of users globally.

136:22 More users than on other platform.

136:25 And Google offers app developers a wide range

136:28 of cross platform tools.

136:29 And we build on this every year.

136:31 Now you've just heard about the cloud platform,

136:34 and now, I want to talk about a few ways that Google Play is

136:38 helping app developers differentiate

136:40 their applications and accelerate momentum.

136:43 We've been making aggressive investments across development

136:46 tools, ways to distribute and engage,

136:49 and new mechanisms to generate robust revenue

136:51 for your business.

136:53 So I'm going talk today about a few of our efforts

136:55 in each of these areas.

136:57 What we're doing to help you develop,

136:59 what we're doing on distribution,

137:01 and what we're doing to help you monetize your apps.

137:03 So let's talk first about development.

137:06 Building a great application.

137:08 A key part of this is testing.

137:11 You've told us the testing can be painful,

137:13 and we want it to be easy.

137:15 Today we are completely thrilled to announce that the Appurify

137:18 team is joining Google.

137:26 Appurify offers the most sophisticated mobile device,

137:29 cloud testing service.

137:31 And more importantly, they're just

137:33 as passionate as we are about delivering high quality user

137:36 experiences.

137:37 Appurify is leading the way in replicating

137:40 how your app behaves in the real world.

137:43 And we're excited to help them further scale

137:45 and bring their expertise to your app development process.

137:49 Appurify allows you to test your apps

137:51 across a wide range of devices.

137:54 And this is critical if you want to be sure

137:56 that your app produces consistently amazing results

137:59 on every type of device, on iOS and Android all over the world.

138:04 But ensuring quality means more than just device testing.

138:08 Appurify service can simulate a specific mobile network,

138:12 and it can even simulate what happens

138:14 if the connection is weak or drops out completely.

138:17 Appurify also gives you detailed log data

138:20 on device performance, network issues, power consumption

138:24 and stability.

138:25 And this means your engineering team gets all the information

138:28 they need to fix the problem without needing

138:30 to repro on a local device.

138:33 Now, developers tell us that testing

138:35 is the cornerstone of creating high quality experiences.

138:39 And we want to make testing available

138:41 to as many developers as possible.

138:43 That's why Appurify will continue

138:45 to be cross platformed on both iOS and Android,

138:50 and available is a freemium service.

138:58 So next, let's talk about building

139:01 apps that help users get the most of wearable devices.

139:05 This is a new area that we're really

139:07 excited about as you can tell.

139:09 Today we're announcing a platform preview of Google Fit.

139:13 This is an open platform designed

139:15 to help users-- yeah, thank you.

139:21 We want to help users keep better track of their fitness

139:23 goals.

139:24 So we're providing a single set of API's

139:26 to manage fitness data from apps and sensors

139:30 on both cross platform devices and on wearables.

139:35 Now, before Google Fit I was trying

139:37 to track and monitor my bike rides through my bike computer,

139:40 and then my weight training through a specialized app,

139:43 and it was a huge hassle.

139:44 The information was way too siloed to actually help me.

139:48 Fit takes away the complexity of handling multiple sources,

139:52 giving you a unified view of a users fitness activity.

139:56 And this helps you create more comprehensive apps.

139:59 So if a user grants permission, apps

140:01 can have access to user's entire fitness stream

140:04 to give better recommendations through

140:06 this additional context.

140:08 So for example, Noom is a weight loss coach app.

140:11 And they've been an early partner on Google Fit.

140:14 So let's just take a second to point out

140:16 how the platform has helped Noom to enhance their app.

140:19 So you'll see that Noom is able to combine

140:22 my workouts, nutritional information, and my weight.

140:25 And because it can talk directly to my Withings scale,

140:29 it can let me know when my daily cookie happy gets

140:31 just that little bit overboard.

140:33 So to centralize everything, Google Fit APIs

140:36 allows fitness apps and brands to share your fitness activity,

140:40 but only with your explicit permission.

140:42 That's the key.

140:43 You're in control.

140:44 You can choose who you share what with,

140:46 and you can delete your fitness activity whenever you want.

140:50 Google Fit APIs are also opening up new access

140:52 to data coming in through hardware from top fitness

140:56 brands.

140:57 For example, Adidas has a collection of smart sensors

141:00 that they're opening up to developers for the first time.

141:03 And we're thrilled to announce that Nike is allowing

141:06 other apps and fitness devices to integrate with Nike Fuel

141:09 through this API.

141:11 Nike will be publishing Nike Fuel to the Fit platform,

141:14 meaning that your app can use it to give better

141:16 insights into user's fitness.

141:19 And of course there are many, many,

141:21 many partners that are joining the Google Fit ecosystem.

141:24 More partners in the program means

141:26 you can all create more meaningful experiences

141:29 for users.

141:30 So we're incredibly excited about the potential

141:32 here for our platform approach in this area.

141:35 We want to make it so that you can build great fitness

141:37 experiences with just one API.

141:40 The platform preview SDK will be available in just a few weeks,

141:44 so stay tuned.

141:47 So next, let's talk about increasing distribution

141:50 for your apps, growing your user base.

141:52 And that's where Google Play comes in.

141:55 So last year we announced our cross platform service,

141:58 Google Play Games.

141:59 And we've been delighted by the response

142:01 from users and developers.

142:03 Google Play Games is now the fastest growing mobile game

142:07 network of all-time.

142:10 We have activated over 100 million new users

142:13 in just the past six months.

142:15 And Google Play Games connects your game

142:17 to a concentrated network of people who love games.

142:20 It makes gaming more fun through services like achievements,

142:24 leader boards, multiplayer, game gifts and cloud save.

142:28 Developers use these to make awesome games

142:31 and bring players back more frequently,

142:33 boosting their success.

142:34 And today, we're announcing new experiences and games services

142:39 to help you further enhance gameplay.

142:41 So first step, we have the new game profile.

142:45 In the new Play Games app your game profile

142:47 changes automatically based on the games you play

142:50 and your achievements in each game.

142:53 This new profile means that each player expresses

142:55 their own gaming identity and it makes

142:57 playing games with friends more fun.

143:00 Since the launch last year, users

143:01 have loved saving their Play Games process in the cloud.

143:05 And we're evolving that now into saved games.

143:09 Users will be able to see bookmarks of their progress

143:12 in the play games app.

143:13 So, Dave had showed us Leo's Fortune earlier.

143:16 This is a really fun game, and I just

143:18 started playing it last week.

143:19 So I can see here in the Play Games app, my saved game

143:22 with a screen shot of me playing level three.

143:25 And we're rolling out a new feature called Quests.

143:28 So Quests is an online time-based goal

143:31 that you can set up in your game, such as collecting

143:34 a bunch of in-game items on a specific day.

143:37 Now we're offering a set of APIs that

143:39 can run these events for your players and reward them,

143:41 all without you needing to update your game.

143:45 We have some early games that have started integrating Quests

143:48 and save games, and we can't wait

143:50 to see how you are going to integrate these

143:51 into your games.

143:53 These features will roll out soon

143:54 in the next update of Google Play services and the Play

143:57 Games app.

143:59 OK.

144:00 So, we've had a look at a few ways

144:02 that you can build high quality, differentiated experiences

144:05 and distribute them to a broad audience.

144:08 Now let's talk about what Google Play

144:10 is doing to help you monetize your business.

144:13 So one popular way that users pay on Google Play

144:16 is their direct carrier billing.

144:18 And this means charging Google Play purchases directly

144:21 to the mobile phone bill.

144:23 Now we've been working hard, rolling out direct carrier

144:26 billing to our fastest growing markets.

144:28 It's taken off really quickly.

144:30 We've just expanded coverage with seven new markets

144:33 for a total of 25 countries.

144:36 We're happy to announce that direct carrier billing is now

144:39 going to be available on more devices, on tablets.

144:42 So if you have a phone and you've already

144:44 set up carrier billing, you'll be

144:46 able to pay for apps, games, movies, music, books

144:50 and other content on your tablet,

144:52 all still paid through that monthly phone bill.

144:55 It'll even work on tablets that are Wi-Fi only.

144:58 OK.

144:59 So there we are.

145:00 App testing, the Google Fit platform, new play games

145:04 capabilities and direct carrier billing for tablets.

145:06 These are four new ways that we can

145:08 help you to create uniquely delightful experiences

145:11 for your users.

145:13 Thank you.

145:17 All right, back to you, Sundar.

145:21 SUNDAR PICHAI: Thanks, Ellie.

145:23 We are seeing tremendous momentum in Google Play.

145:26 And we really take this seriously

145:27 because it translates to success for you all.

145:31 In fact, since last year's I/O, we

145:34 have paid out over $5 billion to developers

145:39 on top of Google Play.

145:44 It's not just the volume of this number,

145:47 but the rate at which this number is growing.

145:49 It's increased 2 and 1/2 times, from $2 billion

145:52 the year before.

145:53 So we are seeing tremendous momentum

145:55 and we have very excited because it directly

145:57 translates developers building their livelihood

146:00 on top of our platforms.

146:03 Of course your all don't just come to I/O to hear stats

146:05 like this, you also come because you

146:07 get your hands on cool new gadgets.

146:10 So, we're going to give you some.

146:17 The first is an interesting one.

146:20 A set of engineers in their 20 person team surprised all of us

146:25 with what you can do, just with the an

146:27 off the shelf cardboard and your smartphone.

146:30 And the combination takes you into a very, very immersive

146:34 experience.

146:35 We're going to hand each and every one of you a cardboard.

146:38 As you walk out from the keynote.

146:40 And please share your thoughts on [INAUDIBLE] cardboard.

146:50 Next, we are very excited about Android Wear,

146:53 and so we're going to give each and every one

146:55 off you either the LGG watch, or the Samsung Gear Live.

147:09 These are great devices, and I hope you enjoy them.

147:12 We don't want you to just create experiences

147:14 for square-faced watches, we want

147:16 to make sure you think about circular ones as well.

147:19 And so we will give each and every one of a Motorola 360 147:22 as soon as it is available.

147:37 It's an incredible time in personal computing.

147:39 You saw our journey today across our platforms.

147:42 Across all these computing devices which people are using.

147:45 It's tough to believe that personal computing started

147:48 only a few decades ago.

147:50 We feel humbled to be part of this journey with you

147:52 all, and we look forward to building

147:54 more amazing experiences with you.

147:56 Thank you, have a great conference.

147:58 [APPLAUSE]